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Birthday Honours

ELSEWHERE in this issue we publish an initial selection from the Queen's Birthday Honours List. As has become customary in recent years, very little recognition has been given to the achievements of those directly concerned with the operation of transport and particularly railways. The highest honour goes to Mr. S. G. Hearn, recently appointed Assistant General Manager (Traffic), Eastern Region, British Railways. Mr. Hearn obviously will receive his well-deserved C.V.O. in connection with his previous duties as Chief Operating Superintendent of the Western Region of British Railways. Mr. James Amos, Chairman of the Scottish Omnibuses Group of the British Transport Commission, has been awarded a C.B.E. Mr. A. W. Woodbridge, Signal Engineer of the Western Region of British Railways and last year's President of the Institution of Signal Engineers, receives the O.B.E. So does Mr. W. J. Lardner, Stores Superintendent, East African Railways & Harbours. M.B.E.'s are awarded to Mr. Frank Fancutt, Assistant Director, Chemical Services, Research Department, British Railways Central Staff; Mr. J. L. D'Espagnac, Engineer, Mauritius Government Railways; Mr. J. V. Martens, Chief Civil Engineer, British Guiana Transport & Harbours Department; Mr. W. L. Bonny, Bridge Engineer, and Mr. F. W. Thorn, Principal, Training Centre (both of Rhodesia Railways); Mr. M. H. Shah, Chief Goods Clerk, East African Railways & Harbours, and Mrs. A. L. Stafford, Hotel Manageress of that system; also to Mr. W. H. Price, Stationmaster at Birmingham New Street, London Midland Region, British Railways. B.E.M.s have been awarded to members of the staff in several Regions, the Pullman Car Company, and the British Transport Commission.

Mr. T. E. Chrimes

FEW men can have so successfully guided a motive power department through more difficult times than Mr. Thomas Edward Chrimes, Motive Power Superintendent, Southern Region, British Railways, who, as recorded in our May 31 issue, has retired after nearly 50 years of railway service. He took the office, then designated Superintendent of Motive Power, in 1944, at the closing stages of the war. As the first Motive Power Superintendent of the Southern Region, he was soon confronted with new traction problems brought about by nationalisation. These difficulties were followed by those of the British Railways' Modernisation Programme. During his term of office, the first multiple-unit diesel trains were introduced, and further extension of electrification was put in hand. Although Mr. Chrimes has no successor as Motive Power Superintendent—the senior Motive Power Officer is now responsible to the Chief Operating Superintendent—it is gratifying to know that the family name will not be severed from the Region. His elder son serves in the Traffic Superintendent's office, and the younger is Acting Assistant to Mr. G. A. Weeden, Acting Senior Motive Power Officer. A biography of Mr. Chrimes appears elsewhere in this issue.

Dissolution of the G.N.R.(I.)

IT has been clear from official statements and from action taken recently by the Governments of Northern Ireland and the Republic to close lines of the Great Northern Railway adjacent to and crossing the Border, that action would soon follow to implement the agreement to dissolve the G.N.R. Board and divide the assets of the railway. Mr. Sean Lemass, Minister for Industry & Commerce in the Republic, obtained leave last Tuesday to introduce before the Dail during the current session legislation to this effect, and parallel action is to be taken by the Northern Ireland Parliament. This will provide as from September 30, for the G.N.R. lines in the Republic and some of the motive power and other assets to be made over to Coras Iompair Eireann; and similarly for the Ulster Transport Authority to take over lines in Northern Ireland, and some assets. The Northern Government is understood to favour closing of the Portadown to Londonderry line, probably in a year's time. Dundalk Works already has been disposed of to motorcar manufacturers. What is to be divided, therefore, is only a remnant of the old G.N.R. One can only regret the dissolution of what has been a remarkably efficient concern, which even now, after closing of so much of its branch-line mileage, is giving good service.

Continuity of Management in Argentina

THE new Argentine Government before taking office proclaimed its intention to abide strictly by the constitution, which lays down that the number of ministries shall not exceed eight. This means that the Ministry of Transport cannot have a separate existence, at least for the time being, and has become an under-secretariat of the Ministry of Public Works, Transport & Communications. Congress, however, has under consideration a law providing for re-establishment of the Ministry of Transport. Meanwhile, the latter is in charge of the new Under-

Secretary, Dr. Alberto J. López Abuin. The Minister will be appointed as soon as the matter is settled. Most of the officers are understood to be remaining at their posts, including the President, Dr. Dante Ardigo, and Members of the State Railways Board and the Administrators General of the several railways. This appears to afford the continuity in management which the Argentine railways so badly need for rehabilitation and improvement.

More Railcars for British Railways

IMPLEMENTATION is proceeding of plans for improving British Railways passenger services by introducing railcars. As recorded in our Contracts and Tenders section this week, orders for 217 railcars have been placed with two manufacturers: 168 with Metropolitan-Cammell Carriage & Wagon Co. Ltd. and 49 with Cravens Limited. The railcars will follow the designs of vehicles of this type previously built by the manufacturers, which shows that these railcar sets are generally proving satisfactory in service. All the Metro-Cammell units are to form three-car sets, and some will be fitted with Rolls-Royce 180-h.p. engines; B.U.T. 150-h.p. engines are specified for all the others. Of the three-car sets 10 are to have a small buffet fitted in the second open trailers similar, it seems, to that installed in the "cross-country" sets of the Western Region. Buffet facilities in diesel multiple-unit trains are new to the North Eastern Region, for which these particular sets are intended, but they have proved popular in other Regions.

Northern Transandine Revival?

EXPECTATIONS of traffic over the 500 miles of the metre-gauge Northern Transandine Railway were not fulfilled during the 10 years since its opening early in 1948. The line, which was begun in the early 1920s, runs from the Argentine provinces of Jujuy and Salta across the Andes to the Chilean coastal region round the port of Antofagasta. It was intended to convey, westwards, cattle, agricultural produce, and timber from Argentina and, in the opposite direction, Chilean minerals or nitrates, and fish from the Pacific, with prospects of export traffic from Argentina for shipment via Antofagasta to the U.S.A. and the Far East. There has been stagnation in trade between the two countries in recent years. Now, however, considerable increase in traffic is expected as a result of Argentine-Chilean commercial agreements. The Chilean section between Augusta Victoria and Socompa, on the Andes watershed, is to be re-laid, and additions are to be made to diesel locomotive fleet and rolling stock. Whether the aditional traffic, if it materialises, will enable receipts to justify the high cost of construction, is problematical.

Gauge Conversion in Queensland

THE development of the uranium ore treatment plant at the extensive Mary Kathleen field in north-western Queensland, which is expected to begin production very shortly, several months ahead of schedule, is an important factor in the Government Railways plans to improve and extend the line from the port of Townsville to the Mount Isa mineral field. These plans are now being considered by the International Bank for Reconstruction & Development. The 600-mile line is at present of 3-ft. 6-in. gauge. It is planned to convert it to standard gauge (4 ft. 8½ in.), and extend it into the Northern Territory. This would improve deliveries of mineral ore from the Mary Kathleen fields, and handling of lead, zinc, and copper ores to Townsville from the Mount Isa mine. It would also provide access to the extensive cattle breeding country on the Barkly Tableland, and help to solve one of the major problems of the North Australian cattle industry. It is not apparently intended to widen the remainder of the Queensland Government Railways, so that the line running inland from Townsville would become an isolated standard-gauge system.

New Marshalling Yard in South Wales

AN increase in traffic at Port Talbot, Llanelly, and other places in South Wales, mainly the result of development of steel manufacture in the area, is the reason for the new yard now under construction at Margam, on the Western Region main line between Pyle and Port Talbot. A brief preliminary description of its main features is given elsewhere in this issue. The site presents some civil engineering problems, notably the displacement of the weir impounding a river which traverses the site, partly with a view to fulfilling the requirements of the River Board as to pisciculture. The terrain is sandy, with dunes adjacent, and grasses are being planted to arrest sand drift—common enough in some yards overseas, but rare in Britain. Except for insulated joints and point and crossing work, rail joints will be thermit welded throughout. Handling of wagons will be controlled automatically, including retarders.

Second Class in the Tropics

FOR many years there has been on railways in Asia and Africa a considerable difference in the comfort provided in, and fares charged for, second class accommodation on the one hand, and third (or sometimes, in India, "intermediate") on the other. The two upper classes until fairly recently were patronised mainly by Europeans. For various reasons, including the growth of private motoring, a tendency was apparent in India before the last war to lower second class fares and to increase the number of berths in second class compartments, without lessening amenities such as fans, but the recent change in the passenger classes in India vitiates comparison with prewar arrangements. It is now reported that new second class coaches on order for East African Railways & Harbours are to contain six berths instead of four and that the intention is to introduce this as a standard with eventual adjustment of the fare structure. Experiments are to be carried out with the open saloon type of second class coach, providing seating accommodation only.

A French Signalling Pioneer

IN France, the great vogue which the Saxby type apparatus came to enjoy there notwithstanding, the invention of interlocking is always attributed to Pierre Auguste Vignier; he was for some 40 years in the service of the old Western Railway. Born at Jossigny, east of Paris, in 1811, he died there in 1891. He was led to study, as were Gregory, Saxby and others in this country, improving the safety of working at junctions. As early as 1847 he designed some interlocking mechanism which by 1854 had taken the form always associated with his name. It was adopted on a wide scale by some railways. He received a gold medal, as did Saxby, at the Paris Exhibition of 1867; but unlike him took out no patent at any time. That may explain why he remained little known outside France. An investigation made in 1938 showed over 2,000 Vignier type interlocking frames to be still in service.

Suspension of Newhaven/Dieppe Service

THE Southern Region of British Railways is to propose to the South Eastern Area Transport Users' Consultative Committee the suspension of the Newhaven/Dieppe steamer service from November next to March. This was among the suggested economy measures mentioned last month by Sir Brian Robertson, Chairman of the British Transport Commission, to Mr. Harold Watkinson, Minister of Transport & Civil Aviation. The French National Railways, with which the service is worked jointly, are in favour, and indeed are understood to have been instrumental in securing temporary suspension as a fuel economy measure after the Suez incident in the winter of 1956-57. There must be regret at the abolition of a joint Anglo-French railway facility that has endured, with few interruptions, caused mainly by war, since 1851; in 1863 the L.B.S.C.R. and the Western Railway of France started their joint steamer service; but there had been attempts from 1847 onwards to operate a service under

railway auspices. The ship operating costs today are high, and patronage in the winter has been poor, largely because, with increased public spending power, the relative cheapness of this route compared with travel via Calais no longer attracts. Normandy, moreover, still will be accessible by the Southampton/Havre route.

Increasing Facilities via Larne/Stranraer

INCREASED demands for transport of private motor-cars and commercial road vehicles between Scotland and Northern Ireland are principal reasons for the approval by the British Transport Commission of construction of a car-carrying vessel for the Larne/Stranraer route. The approval was announced last week by Lord Rusholme, Chairman of the London Midland Area Board and Member of the Commission, at a luncheon given in Belfast by the Ulster Tourist Development Association. He pointed out that the need had been felt for a ship on the route equipped for carrying road vehicles, so that the facility could be available all the year round. British Railways' new Heysham/Belfast steamers, he added, last year carried 51,000 more passengers than had travelled by that route in 1956; against that, there had been a decrease of 15,000 via Larne/Stranraer. Cargo by both routes, however, had increased. These Anglo-Irish services, though partly dependent on summer tourist traffic, seem fully to justify the good facilities given throughout the year. In addition, as has been reported in our pages, much is being done to promote container traffic.

Standard Gauge in Victoria

THE Wentworth Report, which deals with the standardisation of gauges of Australian railways, originally proposed a standard gauge line between Melbourne and Albury by converting one of the existing tracks of the broad-gauge double line from Broadmeadows to Mangalore and the construction of an additional 4-ft. 8½-in. gauge line alongside the 5-ft. 3-in. gauge single track from Mangalore to Wodonga. Investigation of traffic on the North-Eastern and Goulburn Valley lines showed that this would cause a deterioration in services within Victoria, so plans were changed, and a separate standard-gauge line is now to be built between Mangalore and Broadmeadows. Within the Melbourne suburban area standard-gauge traffic will use an avoiding line passing through Footscray, Sunshine, and Albion, to rejoin the main North-Eastern line at Broadmeadows. The scheme is described elsewhere in this issue. The cost of conversion is estimated at £10,000,000, but the elimination of the break of gauge at Albury is expected to save £800,000 a year in transfer costs, and, by reducing transit times and risk of damage to consignments, to attract new business to the railways.

Railway Films

THE International Union of Railways (U.I.C.) some 10 years ago inaugurated an annual meeting at which documentary or instructional films, produced during the preceding year, could be exhibited to railway staff concerned with making films. It was felt that economies might be obtained through joint production by two or more railway administrations. A by-product has been the exchange of ideas and of films themselves. Last year's meeting was held in Vienna, and the 1958 meeting was held recently in Brussels at the invitation of the Belgian National Railways. The practice was adopted two years ago of awarding prizes to the films judged best in the various categories—documentary, instructional, and so on; this year a British Transport Commission film, "Under Night Streets," featuring track maintenance on the London Underground, received an award. Brussels was an appropriate place for the meeting, as a popular feature of the transport display at the International Exhibition is the mock-up of a locomotive cab, arranged under the auspices of the U.I.C., in which the audience is given, by means of films, the illusion of travel through France, Germany, and Switzerland.

Time Limit

NO essential change in the position of the bus dispute has taken place since Mr. Frank Cousins, General Secretary of the Transport & General Workers' Union, made a passionate assertion last Saturday that "they (the busmen) came out, they are out, they will stop out." And if Mr. Cousins maintains his present wall of non-compromise it is difficult to see where cracks may occur for the passage of those chinks of light required by the Minister of Labour before he can effect the intervention so repeatedly called for by the unions. In its basic analysis, the position resolves into Mr. Cousins' attempt to break the resolve of the London Transport Executive against yet further reducing the proportion, as against the nominal value, of the differential between town and country busmen's wages. The Industrial Court's finding on this point is rational and in accord with informed economic opinion held both at home and abroad. While changing economic conditions undoubtedly affect the real value of a nominal wage, the reverse takes place on adjustment of a pay differential. The consequent shifts in purchasing power follow automatically, and these affect our export trade. American reaction to British strikes is already vociferous and critical and, at home, Mr. Heathcoat Amory, Chancellor of the Exchequer, also has spoken of the position with some anxiety. "Much depends on the outcome of wage settlements over the next few months," he has stated recently. He also referred to the effects and results of any important actions on the economy of the country and has urged those responsible to follow wise and responsible conduct.

Responsibility and awareness of the exigencies of the present situation in fact are being exercised at the present time by the General Council of the T.U.C. and, more particularly, by several influential union leaders. Foremost among the latter, to the transport mind, is Mr. S. F. Greene, General Secretary of the National Union of Railwaymen, whose steadying influence already has been noted in this journal. The results of the recent railway pay dispute have shown that Mr. Greene's counsels were wisely heeded by the large membership of his union, and that they were shared by the executives of the other two unions involved is apparent from the united front presented by the N.U.R., T.S.S.A., and A.S.L.E.F. to Sir Brian Robertson, Chairman of the British Transport Commission. Mr. Greene has continued to propagate his gospel of moderation to those members of his union employed by the Underground. By repeatedly urging them to confine their support of the bus strike to a strict observance of normal working and a consequent refusal to operate extra trains, Mr. Greene obviously hopes to maintain union solidarity while declining to encourage a fanaticism which is clearly at variance with the policy of the T.U.C. It is probable that the other railway unions have also contributed to the orderly way in which the underground workers are meeting the situation. Although their names have not been publicly linked with that of Mr. Greene in this connection, it is likely that Mr. W. J. P. Webber, General Secretary of T.S.S.A., and Mr. A. Hallworth, General Secretary of A.S.L.E.F., also have counselled moderation to their members of the Underground. To the general public, which does not appreciate the operating difficulties inherent in a strict observance of "normal working" on a transport system, it may appear that the booking office staff is carrying most of the burden of the increased traffic resulting from an insurge of "new" passengers. While this is not the case, there is no doubt that the strain of a constant, day-long flow of passengers on all those concerned with handling tickets must be very great. Yet no complaints or claims for extra pay have been received from this very considerable number of Underground personnel.

Normal action in abnormal circumstances tends to bring chaos to the Underground. Although the men have been fulfilling their responsibilities within a framework calculated not to break the busmen's strike, the avoidance of unscheduled operating adjustments commonly made

during rush periods causes delays and pile-ups the results of which tend to rebound on the workers themselves. All in all, the men are in a very difficult position. They have no dispute with the Executive, with which they obtained a wage settlement similar to, and within a few days of, that obtained by the main-line railwaymen. On the other hand, they are under constant pressure from representatives of the more militant sections of the bus workers. A conflict of loyalties has been inevitable and, in the circumstances, it is remarkable how well the men are responding to a most difficult situation. Their predicament cannot have been eased by the sudden apparent *volte face* of Mr. Cousins after his recent conferences with the General Council of the T.U.C. Taken all in all, it must be admitted that the lot of the Underground staff today is hardly a happy one. Since the present situation has developed and traffic black spots highlighted, plans have been evolved to modify Underground operation when normal conditions return. A shorter operating day is proposed and a curtailment of little-used services. In addition, lessons are sure to be learned during the present period of abnormal working.

So much for the Underground. As far as the buses are concerned, there are increasing signs of dissatisfaction with the long continuance of the strike, despite constant assertions of determination to hold out indefinitely, if need be. Resignations among drivers and conductors during the five weeks ended June 3 numbered 1,003 against 626 during the corresponding period last year. This represents an increase in the proportion of five to three. The figure is misleading. All these resignations were made in defiance of the union, which had forbidden such action during the course of the strike. The number is therefore obviously minimal. That it may be exceeded with the passing of time appears not unlikely. Indeed, the whole matter of the strike is probably expressible in terms of time—a view that appears to be borne out by the constant increases in strike pay awarded by the Transport & General Workers' Union. One million pounds already has been paid out: it remains to be seen how much more expenditure will be considered an economic proposition. Here, time is very literally money. Both may well be running out.

The Victorian Railways in 1956-57

THE Chairman of the Victorian Railways Commissioners, Mr. E. H. Brownbill, has sent us a copy of their report for the year ended June 30, 1957. The overall results of working the railways, electric tramways, and road motor services under their control were as follows:—

	£A.	£A.
Revenue		37,497,815
Working expenses		39,356,645
Deficit on current operations		1,858,830
Interest charges and expenses including Loan Conversion expenses	3,027,226	
Exchange on interest charges and redemption	124,133	
Contribution to National Debt Sinking Fund	182,546	
Total interest, exchange, etc.	3,333,905	
Deficit		5,192,735

Due mainly to enhanced fares and charges introduced in November, 1955, total revenue in the year under review was £A315,500 higher than in 1955-56, but the corresponding increase in working expenses was £A1,089,000 chiefly as a result of cost-of-living adjustments. Without effective action to control the rapidly-increasing and unfairly-competitive activities of road operators, the State would have to continue to face such increasing deficits, in the view of the Commissioners. They consider that road haulage traffic carried under licence in Victoria for distances of 50 miles and upwards which could be handled satisfactorily by rail, would produce some £A2,000,000 additional revenue if diverted to the railways.

Steady progress was made with rehabilitation and modernisation. To complete the order for 27 branch-line 900-h.p. diesel electric locomotives, 17 were received during the year. An order was placed for ten 1,800-h.p. main-line diesel-electrics, and their delivery began in August, 1957. It was also proposed to order 25 shunting units. Four new country saloon-type coaches were built in railway shops, with the most modern amenities including air-conditioning, rotating and reclining seats, fluorescent lighting, public address system and electric-razor points. The programme envisages eight of these coaches annually in future. An additional corridor coach for the "Spirit of Progress" trains was also constructed. Against an order for 30 new "Harris" suburban electric trains, eight were received and placed in service during the year. There were 268 old-type suburban coaches 50 or more years old still in service; 70 of them will be scrapped when the 30 new trains are in service. At the railways mechanical workshops at Newport wheel-manufacture was to be entirely reorganised in a new shop.

Some of the principal results of working the railways in 1955-56 and 1956-57 are given below:—

	1955–56	1956–57
Average route-mileage open	4,450	4,425
Train-miles	18,634,700	18,544,051
Passenger journeys	166,708,451	167,404,861
Goods and livestock, tons	9,606,783	9,380,699
	£A.	£A.
Passenger, parcels, etc., revenue	12,206,898	12,775,248
Goods and livestock revenue	22,634,546	22,110,500
Total earnings	37,041,824	37,362,754
Working expenses	38,025,775	39,118,678
Deficit	983,951	1,755,924

Suburban passenger journeys increased by over a million during the year to 162,255,068, but suburban passenger-miles rose much more steeply to well over 1,400,000,000, due to heavier traffic from the new outer-suburban areas. Although the volume of goods traffic fell, the efficiency in the working of this traffic improved materially. Gross ton-miles decreased by 0·47 per cent but the corresponding train-mileage was reduced by 1·13 per cent. More notable was the reduction in goods train standing time per thousand miles from 19·6 to 17·7 hours or by 9·7 per cent. This was largely responsible for increases in (*a*) the mileage per goods train-hour by 4·1 per cent, and (*b*) the gross load hauled per train-hour by 3·6 per cent, to 6,550 gross ton-miles. The resulting saving in engine power was reflected in lower working expenses. The doubling, regrading and electrification of the Gippsland line had made possibly greatly improved goods train performance.

The Joint Transport Research Committee approved the closing of the Clarkefield-Lancefield, Birregurra-Forrest, and Hawthorn-Kew lines. The railcar service on the Ararat-Avoca-Maryborough line showed a loss of £A6,800 in 1955-56 and, as there were alternative road services available, it was withdrawn in May, 1957. The Federal Parliamentary Committee formed in March, 1956, to consider gauge standardisation, recommended in October of that year that the 4 ft. 8½ in. gauge be provided between Wodonga and Melbourne.

The doubling of the following sections of the Melbourne suburban lines was in hand, in addition to the widening at Richmond: Heyington-Kooyong, Gardiner-Glen Iris, Mount Waverley-Syndal, on the Glen Waverley line. Also Bayswater-Lower Ferntree Gully (opened in February, 1957) and Croydon-Mooroolbark on the Lilydale line. Several new suburban stations were under construction and the replacement of level crossings by bridges was in hand.

Railway Testing and Research in India

WE have received a copy of the Indian Railway Testing & Research Department's report for the year ended March 31, 1957. So wide is the field of the department's activities that only a few can here be mentioned. Civil engineering investigations hitherto carried out at the Lonavla sub-centre, near Bombay, are being moved to the department's headquarters centre at Lucknow.

Fatigue in rails is one of the most important studies continuing, aided by a testing machine providing a maximum rolling load of 30 tons at a frequency of 27 cycles a minute. The relation between vehicle wheel-diameter and wheel-load is being carefully watched. A new design of crossing and improvements in existing rail flaw-detectors are receiving attention. Metre-gauge block-and-tie-bar

sleepers have been on trial in a main line for three years and have proved successful. A new design for broad-gauge yards and loop lines has recently been evolved. Designs have also been prepared for pre-stressed concrete sleepers for both gauges.

Some 3,400 soil tests were carried out on samples in connection with foundations, banks, cuttings, soil stabilisation and other works. Strengths of concretes, mortars and other materials are continuously the subjects of routine tests, and wind-pressures on bridges and other structures were studied with models.

On the mechanical side, trials were carried out both with a dynamometer car and statically to determine whether fireboxes with three security arch tubes are preferable to the existing design involving one thermit syphon and two arch tubes. The trials had not been completed, but the three-tube type was easier to fit and maintain. Locomotive rating and performance trials were carried out with a variety of coals. Starting and running resistances of vehicles, and braking-distance tests with and without direct admission valves were exhaustive. The effects of Pacific locomotives on 1 in 8½ turnouts were still being studied at the end of the year. Oscillation tests with that type of engine and also with a Bo-Bo diesel locomotive were conducted.

Electrical investigations included the examination of various commercial soil-pressure cells. As they were not considered satisfactory, the department constructed one of its own design. A metre-gauge dynamometer car was on order, and the layout of the electro-magnetic amplifier and detector circuit is illustrated in the report. The work of assessment of electrodes was continued as also was that of the strain-ageing characteristics of Indian-rolled boiler plates. Metallurgical studies of defects and failures of rails, axles, tyres, boiler and firebox plates were an important branch of the department's work. Feed-water treatment, paints and varnishes also came in for thorough experimental investigation at the Chittaranjan sub-centre. The report is excellently produced and illustrated.

Linking Central Africa with the Atlantic

NOW that through rail connection is complete from the Great Lakes, the Belgian Congo mining areas, and the Rhodesia Railways to Lobito on the Atlantic coast of Angola, and some Rhodesian copper is already moving to that port, every effort is being made to increase the capacity of the route. The 838-mile Benguela Railway has therefore to carry heavy traffic from these Central African areas from the Belgian Congo frontier at Dilolo to Lobito, where there is one of the finest natural and well-developed ports in Africa. Between 1945 and 1956 this railway's net ton-km. rose from 259,726,858 to 1,323,380,969, or five-fold.

Besides the increasing transit traffic, considerable increases are expected due to the rapid development of Angola Province. The new wood-pulp industry alone should provide about 120,000 tons of traffic for the railway. Among the many minerals being prospected or developed, manganese ore is already being railed. Lignite is also available and may well be used as locomotive fuel in place of wood.

The port of Lobito, though Government-worked, is closely concerned with the Benguela Railway. In the last year or two its quays have been extended by nearly 800 ft., and grain silos and loading plant with a capacity of 20,000 tons have been completed. Also recently-completed or in hand is an ore-loading plant able to handle 400 tons an hour. More cranes and other equipment are also on order. Some 1,309,000 tons of cargo passed through this port in 1956.

The following are some of the improvements being carried out on the railway. New oil-burning Beyer-Garratts have been placed in service and other engines of the type are being converted to oil in the recently-extended railway shops. Stone ballasting is being continued, 70 per cent of the main line now being equipped with it; additional sleepers are also being inserted. Crossing loops are being lengthened and new ones constructed to accommodate more frequent and longer trains. Bridges are being strengthened to carry 15-ton axle-loads enabling all wagons to be loaded to 40-ton capacity. A new 250-ft.-span bridge is to be built over the Catumbela River and improved watering supplies are being arranged, including an 18½-mile pipe-line from the Corporlo River to Catengue, a watering station on the Benguela-Cubal section, where there are 1 in 40 gradients and 16-ch. rad. curves. These and other improvements are expected to reduce the running times of passenger trains between Lobito and Dilolo by 4-5 hr. and those of goods trains proportionately.

Disc Brakes in the U.S.A.

THERE are today 361 daily passenger runs in the U.S.A. scheduled at over 70 m.p.h. from start to stop, and 21 at over 80 m.p.h., besides 50-60 m.p.h. maximum speeds by freight trains of 3,000 tons weight and over. Braking, therefore, has become a matter of supreme importance. On the long and steep gradients, often with much reverse curvature, through such mountain regions as the Alleghenies and the Rockies, the holding of trains to their prescribed speed limits downhill without excessive brake wear and tear, and overheating of wheel-tyres, would be increasingly costly had the improvements made during the past 20 years not been devised. Besides regenerative braking made possible by diesel-electric locomotive power, there has been the substitution of disc for clasp brakes.

In 1948 the Union Pacific Railroad decided to use disc brakes in new stock being built for its streamline train services between Chicago and the Pacific coast, over some of the longest and most severe gradients in the country. The wear of brake-blocks and the wear-and-tear of brake gear in holding trains at reduced speed over some of the lengthy descents have been severe. Also the high temperatures set up in wheel-tyres as a result of continuous braking have led to the development of thermal cracks and at times to broken tyres, with consequent risk to trains. Formerly it was necessary to examine wheels for thermal cracks after every through trip, and in some cases thermal cracks were found to have developed after one single round trip of about 4,600 miles; mileages of less than 50,000 between wheel turning in the shops were common. Brake shoes seldom lasted for more than a single round trip, and no shoe was allowed to leave either end terminal with less than 1 in. wear still remaining.

The 1948 decision was to apply disc brakes to 100 passenger vehicles, half of them sleeping and half reclining-chair cars. In 1951 some extended tests were made between coaches so fitted and others fitted with clasp brakes. In the former category, the sleeping car *Figueroa*, operating in the streamlined "City of Los Angeles," needed to have its wheels removed for $\frac{3}{16}$ in. tread wear after making 13 round trips between Chicago and Los Angeles, a total of 59,800 miles. On the disc-braked sleeping car *Pacific Island*, one pair of wheels, after having made 24 round trips of 110,400 miles, showed only $\frac{3}{32}$ in. tread wear, and another pair made 23 round trips. 105,800 miles, before $\frac{3}{16}$ in. tread wear made removal necessary. The disc-braked *Pacific Bridge* car had two pairs of wheels which ran 113,800 miles and one pair with 102,000 miles before the $\frac{3}{16}$ in. maximum permitted wear was reached; while another pair, inspected after 127,600 miles, showed only $\frac{3}{32}$ in. tread wear.

With the experience so gained, the fitting of disc brakes was extended, and by the beginning of the present year the Union Pacific had so equipped 385 passenger cars, or a total of 28 train sets with an average of 14 cars each. In addition, delivery is now being taken of 50 head end baggage cars with disc brakes, and 29 existing cars also are being so converted, so that all the cars used in the fastest U.P.RR. services will now be disc-brake equipped.

When the first disc-braked cars were put in service, they were mixed with cars equipped with clasp brakes, but as

soon as the operating advantages of the former became apparent, trains composed exclusively of cars with disc brakes were assembled. The results have been a reduction in noise and in jolting when trains are being stopped. Thermal cracking of wheel-tyres has been virtually eliminated. Slack adjusters can be dispensed with, and there is no further need for the incorporation of speed governor controls. The number of individual brake parts per car has been roughly halved, compared with clasp braking. The bogie overhaul period has been extended from 9 or 18 months with the two types of clasp-braked bogies (with short and long brake-blocks respectively) to 36 months with those equipped with disc brakes, and on the trains concerned the period between wheel-turnings has gone up to 200,000 miles of running.

Most of the Union Pacific coaches are fitted with the Budd Model CF disc brike, mounted on a three-point rubber-supported frame. One point is attached to the centre transom of the bogie, and the other two points rest on the journals. The pivoted and rubber-backed pin-mounted shoes always present the maximum braking surface, and with an emergency brake application provide for a continuous deceleration at approximately 3 m.p.h. per sec. All moving parts of the brake are held under spring compression, which reduces wear and tear caused by vibration and also brake rigging noise. A later development of the Budd disc brake is the Model TFM, which retains the principal characteristics of Model CF, except for the method of attaching the brake assembly to the bogie, which requires no modification of the journal boxes, and is more readily adaptable to certain types of bogie with restricted clearances.

Certain interesting cost figures have been got out comparing the use of clasp and disc brakes on one of the 14-coach "City of Los Angeles" trains over a 12-month period. During this time the train made 73 round trips over the 2,399-mile route, totalling 335,654 miles. The cast-iron tread shoes of the clasp brakes required renewal after every round trip of 4,598 miles, 73 changes of shoes thus being made during the year; the disc brake shoes ran an average of 90,000 miles each, and so required an average of 3·73 changes only. A complete set of the former for one coach costs $47·84 ($63·68 if the long type is used), and of the latter $138·29; over a full year, therefore, the renewals of short clasp brakes cost a total of $48,865·60, and of the long type $65,045·26, whereas the corresponding expenditure for Budd disc brake renewals was $7,221·48.

The Decreasing Volume of Railway Freight

(*By a correspondent*)

THE decline in freight train traffic, which began in the last quarter of 1957, was not so steep in the four weeks from March 24 to April 20 as in the first 12 weeks of this year. One reason was that the influence of restricted oil supplies on 1957 rail carryings weakened with the approach of spring, so that a comparison with 1958 is fairly straightforward. The tonnage originating in the four weeks to April 20 totalled 19,761,000, about 1,460,000 tons (or 6·0 per cent) less than 1957 forwardings. The railways carried 430,000 fewer tons of merchandise, including livestock, a decrease of 12·9 per cent. There was a fall of 578,000 tons in minerals; this drop of 11·7 per cent in a traffic that expanded by some 6 million tons between 1950 and 1956 may be due in part to a decline in iron and steel output. Declarations of coal and coke were down 451,000 tons, or 3·5 per cent; large decreases happened in the Western, Eastern and North Eastern Regions, while the London Midland had an increase of 6,000 tons and the Scottish Region carried 194,000 more tons than in 1957 (a rise of 12·3 per cent).

The railways moved the diminished traffic by working 1,492 million ton miles, a saving of 137 million, or 8·4 per cent. There is no satisfaction in recording the economy. What the railways need is more traffic and more work to do. Since 1953 an ominous downward trend in their share of the country's transport has set in. Compared with the April period of 1953, this year's tonnage shrunk by 2,137,000 tons, or over 9 per cent. The railways lost 824,000 tons of merchandise (22 per cent), 574,000 tons of minerals (11 per cent) and 838,000 tons of coal and coke (6 per cent). The corresponding ton mile volume was 238 million less, a fall of 13 per cent. And the end of a five years' recession is not in sight!

An article in *The Railway Gazette* of May 30 explained the critical financial state of the American railroads owing to a sharp fall in the volume of freight movement, which furnishes 85 per cent of their operating revenues. A severe setback in the steel, coal mining and other heavy industries was the direct cause of a precipitate drop in wagon loadings. For the first quarter of 1958 freight revenue, passenger revenue—a small item—and total operating revenues all dwindled by over 13 per cent, while expenses were reduced by only 7·4 per cent. As a result, the operating ratio rose from 78·5 per cent to 83·7. Net railway operating income, or earnings before charges, fell by 60 per cent from $214 million in 1957 to $84 million.

These figures mean that the railroads are left without an adequate net working capital to meet cash expenses for wages, fuel and materials, and rents and taxes amounting to about $750 million a month. The Senate Committee on Interstate & Foreign Commerce is gravely concerned about the deteriorating railroad situation and is now considering a useful and sympathetic report from its Sub-committee on Surface Transportation, which discusses the problems involved and recommends measures for giving prompt help to the rail carriers, as well as an extensive study of some long-range policy matters.

Letters to the Editor

(*The Editor is not responsible for opinions of correspondents*)

Smoking in Trains

June 3

SIR,—Mr. S. E. Lord refers in his letter in your May 30 issue to a matter which is very much in our minds at present.

We realise that it may be necessary to increase the proportion of non-smoking accommodation from its present 18 or 19 per cent—but we must be quite sure that we gauge the position accurately for, of course, smokers have rights as well as those who do not smoke.

I assure Mr. Lord that as far as we are concerned there is nothing sacrosanct about open saloons: we may introduce non-smoking saloon coaches on suburban lines—they already exist, of course, on main line trains—if and when we are satisfied that this will provide the balance of accommodation that passengers want.

Yours faithfully,

F. D. Y. FAULKNER,
Public Relations Officer

British Railways, Southern Region, Waterloo Station, S.E.1

June 6

SIR,—I have travelled recently in many European countries and am quite unable to agree with what is stated in the last sentence in the editorial note about smoking in your issue of May 9.

My experience is that people seldom attempt to smoke in non-smoking compartments on the Continent; but if they do, an official soon tells them to cease. He does not wait for another passenger to complain as in England. In some countries officials have the power to fine offenders on the spot. In unlabelled or "neutral" compartments in France and other countries a passenger wishing to smoke often asks others if they object, especially if ladies are present.

It would be much better for every traveller if the by-law were more strictly enforced in Great Britain.

Yours faithfully,

F. JOHNSON

Bonnington Hotel, Southampton Row, W.C.1.

THE SCRAP HEAP

"Glasgow Belongs to Me"

The last train from the gracious city of Glasgow to Edinburgh leaves Queen Street at 10.15. Certain Glasgow gentlemen of our acquaintance consider that this is an insult to the fair name of their city. They see no reason why the last train should not leave at midnight, and have requested us to make public this desire of theirs.—*From "The Scotsman."*

No Farewell to Steam

Diesel railcars recently placed in service on a branch in Sardinia are allowed 45 min. for the 22-mile journey, including stops, compared with 2 hr. 15 min. for the previous steam trains of four-wheel coaches hauled by 2-6-0 tank engines. On the first day of diesel working passengers booed and shook their firsts at steam locomotives still working the goods trains and shunting now disused passenger coaches.

Tram Falls on Railway Track

A tram recently was derailed in Copenhagen, demolished part of the parapet of an overline bridge, plunged down the slope of the cutting, and came to rest on the railway track, along which a Hamburg express of the Danish State Railways was approaching. Three railwaymen who happened to be near ran towards the train and signalled the driver to stop. The engine had slowed down to walking pace when it hit and knocked away the front of the tram, in which 18 passengers were injured, none seriously.

Lucky Travel Date

"It must be my lucky day," said Mrs. M. J. Astbury at Perth railway booking office, when told to put away her cheque book and travel as the guest of the Commissioner of Commonwealth Railways. Mrs. Astbury, who lives in New South Wales, went to the station to book a passage home for July 8. She did not know of the Commonwealth railways competition, which provided for free travel for the first person to book for July travel after a secret date in April.

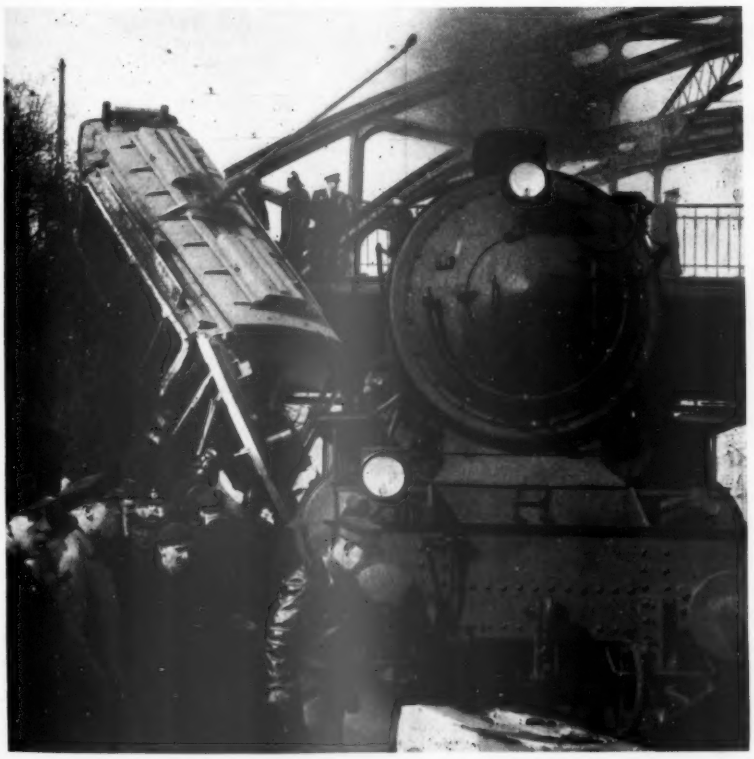
Four free tickets were given, one from Perth to anywhere in the Eastern States, one from Adelaide to Perth, and two from Melbourne to Perth. Her free ticket, including sleeper and meals, is worth £36 2s. 9d.—*From the "Sun" (Melbourne).*

Railways are so Bracing

Shortly after the opening of the London & Birmingham Railway to Tring, on October 16, 1837, Dr. James Johnson, "a physician of first-rate talent and deserved eminence," wrote: "Railway traffic equalises the circulation, promotes digestion, tranquillises the nerves, and often causes sound sleep during the succeeding night; the exercise of this kind of travelling being unaccompanied by that lassitude, aching, and fatigue, which, in weakly constitutions, is the invariable accompaniment of ordinary travelling (by coach); and which so frequently, in such constitutions, produces sleepless nights. The Railroads bid fair to be a powerful remedial agent in many ailments to which the metropolitan and civic inhabitants are subject; and to thousands of valetudinarians in the Metropolis, the ride to Tring and back twice or three times a week, would prove a means of preserving health, and prolonging life, more than all the Drugs in Apothecaries' Hall."

Wrong Train?

I was distinctly puzzled by the railway sound effects heard in "So I'll Tell You" (B.B.C. Light Programme, May 5). Soames and Catchpole arrived at Victoria (presumably the Brighton side) to catch a train to Lewes. In the background were numerous locomotives apparently letting off steam, a rare sound in that section of the station. When they reached Lewes a steam train distinctly puffed away. They had obviously scorned the direct route by electric train. Had sentiment urged them to travel on the "Bluebell" line from East Grinstead? No, that was closed to passengers on March 16. Obviously, the foolish Catchpole had led Soames to the wrong train; they had discovered their mistake at Redhill, and changed on to one of the steam-hauled through trains from the North to Eastbourne and Hastings.—*From a letter to "The Radio Times."*



Locomotive of Danish State Railways passenger train halted just short of concrete block from bridge parapet demolished by derailed tram

Computers' Corner

(*See our May 23 issue*)

When so much at the present time
Is super-super-sonic,
We enter gingerly upon
The era electronic.
The nomenclature's wonderful
And, really, rather cute;
It sound so very cosy when
"Peggy" and "Deuce" compute.
And all this is because we hear
That electronic brains
Are being used to check upon
The timings of our trains,
Which, on the whole, ought to be good
For a few hearty laughs
From those who hitherto have spent
Their working lives on graphs.
They're useful, too, in other ways;
With them there's no excuse
For any "solo" fan to go
"Misère" without the "deuce."
We shall observe these brains contend
With interest at heart.
Though, nominally, "Pegasus"
Should get a flying start!
But should man's fallibility
Incite these "brains" to scoff,
He has the last word: he can switch
The darn things on and off.

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Alsthom Diesel Shown at Bulawayo

The public has been able to inspect the 1,100-h.p. Bo-Bo 3-ft. 6-in. gauge Alsthom diesel-electric locomotive displayed at Bulawayo. The locomotive was sent to Rhodesia at the suggestion of the French National Railways before delivery to the Congo-Ocean Railway in French Equatorial Africa.

EAST AFRICA

School Traffic

The scale of movement of children at the beginning and end of term to and from boarding schools is a serious problem for E.A.R. & H. in Tanganyika. The totals carried over the Road Services each year are now nearly 14,000: 7,000 African children, 6,000 European, and 600 Asian. Six hundred organised moves have to be arranged to meet the demand. Travel by children going on or returning from school holidays also sets a problem of accommodation in both Kenya and Tanganyika, especially in the relatively restricted amount of upper class passenger stock.

INDIA

Books at Half Rates

Parcels of books conveyed by passenger or parcels trains on the Indian railways are now charged at half the normal parcel rates as against the full parcel rates previously charged.

WESTERN AUSTRALIA

Level Crossings in Perth

Between Perth and East Perth, on the main Eastern Railway there are three level crossings equipped with gates. One of these, at Pier Street, has been closed to vehicular traffic for some years, and the signalbox controlling the gates removed, and the other two, while opened to road traffic at frequent intervals, are the cause of considerable delay to road users and consequent complaint. The terrain in this area is too flat to permit normal bridges or subways.

The railway line in this area is probably the busiest section on the Western Australian railway system, including, in addition to country passenger and goods trains, a fast and frequent suburban service, and although there has been persistent agitation for the reopening of Pier Street and the more frequent opening of the Moore and Lord Street crossings, this has been resisted because it is stated that the frequency of trains does not permit greater use of the crossings with the existing signalling equipment.

Mr. H. E. Graham, the Minister for Transport, has now announced that although there are difficulties associated with the reopening of Pier Street, due to its short distance from Wellington Street, investigation has shown that the introduction of electric automatic half boom gates at the other two crossings, at a cost of between £26,000 and £30,000, would enable these two points to be used to a much greater extent than at present, and that it was proposed that the work be put in hand.

It is estimated that an annual maintenance cost of £500 will be involved in operating and maintaining the boom gates, but that there will be a saving to the Railway Department of £5,000 annually in the cost now necessary for manual operation of signals and gates.

The installation cost of the new equipment is to be met from a fund recently set up under the Traffic Act and termed the Metropolitan Railway Crossings Fund. An amendment to the Traffic Act covering this fund provides that vehicle transfer fees in the metropolitan area be increased from 10s. to £1, the additional 10s. being used to improve railway crossings.

It was stated further that the co-operation of the railways in train running would be sought to enable the new gates to be open as much as possible for road traffic.

VICTORIA

Results of Reducing Goods Rates

New rates on the Victorian Railways have cut the cost to manufacturers using containers from £37 10s. to £35. This reduction has stimulated a return to the railways and resulted in lower prices to consumers. The railways have 200 containers in service for ordinary freight and 50 for perishable products. The ordinary containers are used for unpacked goods, bottled ales, wines and spirits, groceries, cheese, and so on, especially between Melbourne, Sydney, and Brisbane.

Recently they were used for refractive bricks for household and industrial use. Despite their brittleness and transhipment at the State border, the bricks reached Sydney from Melbourne in good condition. The firm concerned saved so much on packing costs that it could reduce its selling price.

Rebuilding Fawkner - Somerton Line

The abandoned railway from Fawkner to Somerton is to be rebuilt and partially electrified by the Government Railways to serve the new £11,000,000 factory now being constructed for the Ford Motor Company at Campbellfield, near Broadmeadows.

The line will be rehabilitated, and a direct connection will be provided at Somerton with the North Eastern main line to Albury, New South Wales. This stage is expected to be completed by April, 1959, when the line will become available for freight traffic.

The second stage of the project will be the electrification of the line from Fawkner to a new station at Campbellfield alongside the factory. The cost of both stages of the work is estimated to be £300,000.

It is also probable that a spur from the new standard gauge line from Melbourne to Albury will also be built to serve the Ford factory. This would enable the company to ship materials and completed cars direct by rail to Sydney or Brisbane, without transhipment at Albury.

PHILIPPINES

Successful Diesel Operation

The Manila Railroad is reported to have showed a profit during the past financial year for the first time in its history. The management states that the reasons for this include the efficiency of the General Electric (U.S.A.) diesel-electric locomotives. Operation by 1,200-h.p. and 500-h.p. diesels began in 1956.

CANADA

Operating Long Trains

The longest passenger train ever operated in Canada, 26 passenger coaches and three diesel units, took 964 Canadian National Railways passengers who disembarked from the liner *Saturnia* to various sections across Canada recently.

The previous record was established on April 15 when a 24-coach C.N.R. train handled 761 passengers from the Greek liner *Olympia*. Up to that time the number of coaches in passenger trains was limited to 15 units in wintertime and 18 in summertime.

Mr. Frank M. Ward, General Superintendent of Transportation, Atlantic Region, C.N.R., has stated that the operation of such long trains has been made possible by the use of diesel locomotives.

UNITED STATES

Large Coal-Loading Machine

In connection with Chesapeake & Ohio Railroad's new £13,000,000 coal dock at Toledo, Ohio, what is claimed as the largest machine ever designed for loading coal into the holds of ships has been purchased by that railway from Germany. Its capacity is stated to be 6,000 tons of coal an hour.

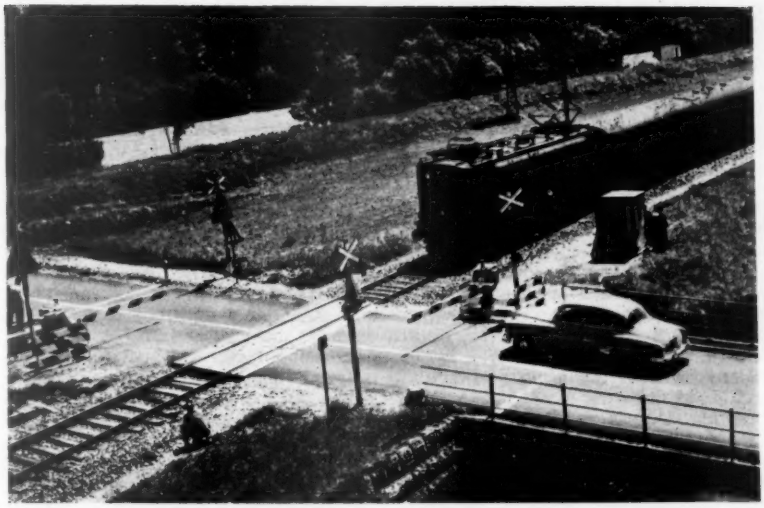
Increased Freight Rates

The Interstate Commerce Commission has approved certain increases in the charges for freight over American railways. Of these the principal are

3 per cent for grain and livestock, and rather less for other agricultural products; 2 per cent for lumber; 1 per cent for meat and packing house products; and 10 cents a ton for coal. The proposed extra charges for other kinds of freight were cut, but certain increases were permitted.

The I.C.C. estimated that these changes should bring in an additional revenue of $182,000,000 annually; but the estimate seems optimistic, as it does not follow that individual States will authorise corresponding increases in intra-State rates—that is, rates for carriage entirely within the borders of the State concerned.

Also the changes authorised by the I.C.C. are subject to the rule that if, after further investigation, it decides to cut down any of the increases granted, the railways will be obliged to refund the amounts that will have been overpaid.



Barriers closed, 5 to 6 sec. before train reaches crossing

SWITZERLAND

Reconstruction of Berne Station

Preliminary work is reported to have begun on reconstruction of Berne passenger station. It involves cutting away part of the hill adjoining the station to make room for additional tracks and platforms.

Automatic Level Crossing Barriers

The accompanying illustration shows automatic barriers at a crossing on the Monthey - Bouvet line of the Federal Railways. At least 25 sec. before the arrival of a train the red flashing lights appear, accompanied by a bell. About 7 sec. later the barriers begin to descend, taking about 12 sec. to do so, closure being completed from 5 to 6 sec. before the train passes.

Immediately it has cleared the crossing and, where there is more than one track, no other train is approaching, the barriers rise, taking 10 sec. to reach the normal vertical position.

AUSTRIA

Improvements to Arlberg Line

The Federal Railways have completed plans for improving the Arlberg line with the aid of a credit granted by Switzerland and an Austrian Government grant. The Arlberg line between Innsbruck and Buchs is single track. As doubling is not possible at present, the running loops at certain stations between Innsbruck and Buchs are to be lengthened, and signalling modernised. Telecommunications are to be improved.

To increase running speeds on the line, with its many curves, it is necessary to straighten the section at the Ill bridge and a section close to the station at Nenzing, which will enable the maximum speed to be increased from 45 to 75 m.p.h.

Publications Received

A Symposium on Aluminium and Its Alloys in Electrical Engineering. London: Aluminium Development Association, 33, Grosvenor Street,, W.1. 8½ in. × 5½ in. 370 pp. Illustrated. 20s.—The papers and discussions, with the authors' replies, presented at the symposium arranged by the Aluminium Development Association on aluminium and its alloys in electrical engineering, held last year, are covered in this publication. The symposium was divided into three sessions dealing with the general and economic considerations of using aluminium in electrical engineering; the use of the material in transmission and distribution lines and aluminium in electrical equipment.

Fourth Report on the Work of the European Conference of Ministers of Transport. Paris 16e. Published by the Secretary to the Conference at 3, Rue André Pascal. 9½ in. × 6 in. 91 pages. Parallel texts in French and English. No price stated.—This booklet covers many items, preceded by a general note of the work of the Conference, the effect of the recommendations made during the previous year, and a forecast of future developments. Matters dealt with include the financial situation of the railways; co-operation between railways and other methods of transport; and the standardisation of rolling stock, with special reference to Eurofima. The first report of Eurofima is reviewed. The statements furnished by each country as to its railway modernisation plans and the progress attained under them to date are the subject of comment.

The Channel Tunnel. By Humphrey Slater and Correlli Barnett, with the collaboration of R. H. Géneau. London: Allan Wingate (Publishers) Limited, 12, Beauchamp Place, S.W.3. 8½ in. × 5½ in. 213 pp. Illustrated. Price 21s.—After lying dormant for more than a quarter-of-a-century, the scheme for a tunnel under the English Channel has again become a live issue, partly through the possibility that the undertaking might be financed by the Suez Canal Company. This book outlines the schemes, plans, and even preliminary engineering work which have engaged attention at intervals since 1802. The authors have told this story mainly from the political point of view, but with incursions into geology. They have also assembled a fine collection of illustrations. Thomé de Gamond (1807-76) is presented as the hero who "turned the tunnel from a dream into a business proposition," and Sir Garnet Wolseley as almost the villain of the piece, because he led the military opposition to the tunnel which caused the abandonment of construction in 1883. The facetious style of writing, and an excess of polemical historical asides, detract from the serious narrative. The viewpoint is mainly French or (in recent times) American, and there are some sneers at things British, including, quite unnecessarily, the catering services on British Railways.

Goods Handling Schemes.—Section 1 of the catalogue of various mechanical handling installations with which the company has been concerned has been issued by Paterson Hughes Engineering Co. Ltd. It covers principally the various types of conveyors manufactured or installed by the firm. Copies of the 26-page catalogue may be obtained from the company at Bedford House, Bedford Street, Strand, London, W.C.2.

Seventeenth International Railway Congress

Advantages of High-Speed Electronic Apparatus

Payroll, traffic, and stores accounting: checking the movement of empty and loaded freight wagons

MR. STEN UBBE, Chief Stores Manager, Swedish State Railways, has prepared the report on replies to Question 7 to be considered by the International Railway Congress in Madrid later this year. It is based on replies received from Nigeria, South Africa, Rhodesia, Norway, Egypt, Japan, Sweden, the United Kingdom, and U.S.A.

In Mr. Ubbe's opinion, the question appears to have been taken up for consideration at far too early a stage. Replies received show that development is generally in such an early phase that there is, as a rule, very little experience to relate.

The main fields of application which are generally adapted to the electronic data processing machine system are those where a certain degree of mechanisation has already been reached, preferably with the help of traditional punch-card machines. Apart from general accounting and cost accounting, the fields with the greatest number of applications are stores accounting, payroll and staff statistics, freight and passenger traffic statistics, and mileage statistics for individual wagons in relation to maintenance.

Payroll Accounting

Payroll work includes determining how long the employee has worked, calculating earnings and taxes, and making deductions for taxes, superannuation contributions, and trade union quotas in order to obtain the net salary figure. Besides this, the work also includes the important task of supplying the management with much information based on numerical salary material, in statistical or other form for various administrative purposes.

Payroll work is one of the classical applications for the punch-card technique. There are many advantages in the system, but the electronic data processing machine (E.D.P.M.) develops these even further. A system which incorporates electronic computers as the main part compared with a pure punch-card system, shows itself to be superior by reason of speed, accuracy, and internal memory capacity. E.D.P.M. has proved to be particularly useful in highly repetitive operations requiring access to a great deal of information. It relieves office personnel of monotonous routine tasks to a greater degree than earlier machines, and by means of its ability to perform long series of work operations within itself, E.D.P.M. also eliminates the physical transfer of data from one process stage to another.

Both the amount of basic material; punched cards, magnetic tape, paper tape, and so on, and the number of separate factors involved, can be considerably reduced because of the possibilities of storing in advance fixed values in table or other forms in the internal memory and also working out and temporarily storing intermediary information for the continued calculations.

It often happens that the basic material need not undergo any special sorting, but can be fed in in random sequence, because the storing capacity of the machine makes it possible to identify the correct data at determined times in the course of operation.

Control Unit

The control unit in an E.D.P.M. system, that is the unit that conveys the fixed instructions to the memory and the arithmetical organ and directs the operational sequences, makes possible a hitherto unknown automation of payroll accounting.

The programming must be preceded by an analyses of all details in the payroll system, but when the programme is tested and ready, the machine can carry out all the operations instructed, quickly, accurately, and without human intervention.

The memory unit delivers the values needed by the control unit and transfers them to the arithmetic unit. It stores worked-out part results and delivers the final results to the output units. It can also store these final results. At present E.D.P.M.'s are available with varying internal memory capacities.

Mr. Ubbe believes that for the payroll application at railway administrations, a capacity of some 20,000 digits would suffice to manage the work in one operation on an E.D.P.M. Therefore, the majority of administrations need not consider anything other than the medium-sized computers for payroll and similar applications. For applications such as ticket booking, pre-notification of loaded wagons, and stock accounting, both a large memory capacity and shorter access time are probably required.

The arithmetic unit performs the counting operations at electronic speed. The counting speed and number size for the four common counting methods are usually more than enough for payroll work, but on the other hand, eliminate the frequent need to divide both detail factors and final results in cases where ordinary punch-card calculators are employed. Among the advantages of the arithmetic unit is also its ability to carry out quickly sign tests and zero control for branching purposes. This is something that has proved to be of great use in payroll accounting with its complicated system and varying basic factors.

The output unit receives the results of the machine's calculations and delivers them in a form that personnel or similar machines can use. With regard to payroll, the results are usually so conclusive and differential that, without further processing, they can be directly and quickly listed in tabulators for various purposes.

Only five of the railway administrations questioned definitely stated that they had taken payroll accounting into consideration, namely, the British Transport Commission, London Transport, Egyptian Republic Railways, Norwegian State Railways, and Swedish State Railways. None of the administrations has yet installed any proper E.D.P.M., but as far as is known, the Swedish State Railways will be the first to do so in the near future.

Mr. Ubbe finds it impossible to draw any general conclusions from the answers received, although it is clear that all the managements expect E.D.P.M. to offer considerable advantages in the mechanisation of payroll accounting and such things as cost distribution and staff statistics connected with it.

Traffic Revenue Accounting

The only administrations that have dealt with the application of traffic revenue accounting are Rhodesia Railways and the Swedish State Railways. The latter appear to have had the most experience.

In the field of traffic revenue, accounting and statistical work at stations, checking and distribution work at control offices, and basic treatment work at statistical offices, can be rationalised by mechanical processing of data. Even conventional punch-card systems offer great advantages as compared with manual or simpler mechanical processing of the large amount of data generally encountered in this field. Installation of electronic data machines can provide still further rationalisation and also considerably improved information at a lower cost.

In the passenger traffic field it is possible to build up a uniform accounting system with effective control so long as the mechanical processing of station accounting employs a data machine. By using an accounting system of this kind it is possible to cut down the accounting work at ticket accounting offices, obtain mechanically compiled basic material for settlement with other administrations, and also provide practical statistics.

In the data machine department of the Swedish State Railways, special card-

indexes are set up containing punch-cards, relation cards for each occurring relation concerning ready-printed tickets, and machine tickets and blanks for every type of ticket. The relation cards are pre-punched with all fixed details required for further processing. This pre-punching is of a non-recurrent nature and is carried out at the setting-up of the card-indexes. With the relation cards as a basis, ticket accounts are made centrally and sent out to the accounting offices which have then only to complete the forms with sales figures.

Two different types of accounting forms can be made up for the proper accounting at stations. A special gross accounting is made for all tickets, whereby no attention is paid to cancelled tickets or half-ticket vouchers. For accounting of these last two items, a deduction account is used on which the station counts the amounts it has to credit itself for cancelled and half tickets.

Special accounting of tickets in separate accounting groups is not required; all tickets are to be found on the same accounting list, no matter if they are travel tickets, excess fare tickets, or baggage surcharge tickets. The station need not even state whether the tickets were issued in transfer traffic as the necessary distribution of charges is made in processing in the data machine department.

When the accounting forms completed by the accounting offices have been returned, and the control office has checked newly-created and concluded number sequences, the punch-card processing can begin.

The amount of punch work necessary for ready-printed tickets and machine tickets is very little. If the statistical data necessary for processing take up a limited number of columns, the relation card can be used for three or four periods accounting, after which the fixed details on the card are mechanically reproduced on a new card.

Statistical Results

The electronic data processing method makes possible a comprehensive division of material from different points of view. Without any appreciable increase in costs, statistics that are more detailed than before are quickly obtained. As mechanical control requires identification information which, in some parts, coincides with a statistical division of the material, a ticket code can be devised which renders possible an initial processing of ticket accounting for control, settlement, and statistics. The statistical reports as end products of electronic data processing could be, for example, as follows: (*a*) sales report with individual figures for each transaction; (*b*) operation control report consisting of an enlargement of the sales report; (*c*) certain statistics per region or section; (*d*) special statistics for local traffic; (*e*) result statistics with total sums worked out per ticket type for each accounting office; (*f*) tariff statistics.

The data processing of tickets printed in ticket machines at stations is in principle similar to the processing of ready-printed tickets. The benefits of this system, however, are not so tangible when it comes to machine tickets, as the stations need not calculate the same sales figures for these tickets as for ready-printed tickets. A collection control by data processing machine is therefore unnecessary, but the statistical division can, without difficulty, be made as comprehensive as for ready-printed tickets. Mr. Ubbe does not consider it advisable to base punch-card processing of blanks on the counterfoils, unless statistical information is required for every ticket. On the other hand, a certain control and statistical work on the total amounts of each ticket type can be done in punch-card machines, in which way it becomes possible to make up a uniform accounting system for all types of ticket.

Freight Traffic

As with passenger traffic, mechanisation and processing of accounts from stations can mean considerable benefits also for freight traffic. That part of freight traffic which is advantageous to process is mainly loaded wagon traffic in which every consignment is of great value to the railway from a control and statistical viewpoint. The limitation of the conventional punch-card machines means that a processing based on such machines is confined mainly to certain grouping of the material for the control office's checking work and production of statistical data, which do not generally allow detailed analyses. Moreover, the value of the statistical results is reduced because they cannot usually be collocated until a considerable time after the actual traffic month.

Installation of E.D.P.M. for handling of freight traffic accounting provides quicker processing which means that facts, essential to the management for judging situations, can be produced in time for direct action to be taken where necessary. A large amount of data for control and statistics is to be processed at every opportunity, and for this reason, an electronic data machine is particularly suitable as a technical aid. When processing in the data machine, it is often possible to obtain results at the same time for control and statistical purposes, for instance, freight control and a simultaneous calculation of ton-km. for every loaded wagon consignment.

Stores Accounting

It appears from the reports received from the majority of administrations that inventory control is at present handled completely by punch-card processing of a more or less advanced type, but that E.D.P. is being studied. However, no detailed descriptions have been given of plans to solve the problems of stores with the help of E.D.P., or what advantages E.D.P. will bring as compared with traditional punch-card processing. It appears that the studies that have been made in this field have not progressed far enough for any administration to venture an opinion of the actual method; only certain conceivable possibilities are described.

Mr. Ubbe, however, states that enough has emerged from personal discussions with representatives from administrations which have the matter under study to show that E.D.P. machines are expected to provide a means of rationalising and thereby lowering the costs of storage.

Inventory control and payroll are the applications first considered when it comes to selecting fields of use for data processing machines. He is of the opinion that the explanation of this lies in the fact that the mechanisation of this work at several administrations has already progressed so far as to greatly facilitate a conversion to E.D.P. machines. Another contributory factor, he states, is the large amount of data re-occurring at short intervals in the processing schedule. What is expected of data processing machines is that methods and routines can be worked out with their help which will make it possible to keep the stocks at a level justifiable with regard to the railway's general economic structure. This, therefore, is to be accomplished by an effective control and estimation of the stocks and purchase quantities.

The routines would no doubt mean automatic correction of the order points by alteration of any of the variables on which the order point is based, signalling of impulse for ordering, floating order point, and automatic calculation of purchase quantities. By means of this, it is expected to be able to reduce considerably stocks in hand and thereby release the capital tied up in them, and as a result of this, also reduce the railway's interest expenses. This can be achieved, to a certain extent, without employing the E.D.P. method, but Mr. Ubbe maintains that this method will lead to better results and at a lower cost.

IMPROVEMENTS AT SOUTH WALES AND KINGS LYNN DOCKS.—The British Transport Commission has authorised schemes costing £500,000, for new quay cranage, wharf reconstruction, and two new tugs at the South Wales ports, and £250,000 for quay modernisation at Kings Lynn. At Swansea, the West Wharf in Prince of Wales Dock, 650 ft. long, which has been out of use for some time, is to be reconstructed. Railway lines and crane tracks will be renewed and the surface paved in concrete. Four electric cranes will be transferred to the West Wharf from Kings Dock and will be replaced by four new electric 6/3-ton cranes equipped for the discharge of bulk dry cargoes by grab. For services at Newport, Cardiff, and Barry two 900-h.p. diesel tugs will replace two steam tugs. At Kings Lynn, the South-East Quay, Bentinck Dock, is to be modernised. The scheme includes replacement of hydraulic by more powerful electric cranes and improved railway track layout.

Gauge Conversion in Victoria

Provision of 4-ft. 8½-in. track between Melbourne and New South Wales border

(*By a correspondent*)

THE gauge of the Victorian Railways is 5 ft. 3 in. Work on the conversion to 4 ft. 8½ in., the New South Wales Railway gauge, of the railway between Melbourne and Albury, on the New South Wales border, started on November 4, 1957. Some 30 men set up camps at Wodonga (187 miles from Melbourne), Barnawartha (174), and Euroa (95).

Small bridge work is being attended to at first in the areas in which the camps are situated. A temporary building is also being erected at Spencer Street Station, Melbourne, to house technical staff for the project. The decision to begin this work is consequent on a report made by a committee of members of the Australian Commonwealth Parliament formed in March, 1956, to consider the question of standardising the gauges of Australian railways. The report was issued in October of that year, and has become known as the Wentworth Report, from the name of the committee chairman, Mr. W. C. Wentworth.

The Wentworth Report recommended conversion to standard gauge of three trunk lines. These were (1) from Melbourne to Wodonga in Victoria on the main Melbourne-Sydney line; (2) from Broken Hill in south-western New South Wales to Port Pirie and Adelaide in South Australia; and (3) from Kalgoorlie to Perth in Western Australia. Of these three, priority was given to the first two, but the report states that it was difficult to decide which of the two was the more important.

During the first half of 1957 it was announced that the Governments of New South Wales and Victoria were in agreement on the conversion of the Melbourne-Sydney line between Melbourne and Wodonga. Tenders were later called for an aerial survey of the section concerned and this was subsequently carried out.

Present Melbourne-Albury Route

The route between Melbourne and Albury consists of 190 miles of 5-ft. 3-in. gauge track. Some fairly heavy grades are encountered during the first 60 miles to Seymour, but, after that, the line passes over fairly level country. The electrified suburban section through which trains to and from Albury pass extends for 11 miles to Broadmeadows, which is 408 ft. above sea level. It is not intended to convert this section, and further reference will be made to it later. From Broadmeadows, the line climbs gradually up the slopes of the Great Dividing Range of Victoria, rising to a height of 1,145 ft. at Heathcote Junction, where there is a cross-country line to Bendigo on the "down" side of the main track. From Heathcote Junction the line descends the opposite slopes of the Great Divide, passing through Tallarook, where the Mansfield branch swings away to the eastward, or from the "up" side.

From Tallarook (585 ft.) there is a descent to Seymour (454 ft.) 61 miles from Melbourne, and junction for the Goulburn Valley line and its branches. After another seven miles Mangalore, with its triangular-shaped platform, is reached, and this is the physical junction for trains routed for the Goulburn Valley. The latter branch is the most important one on the Melbourne-Albury line.

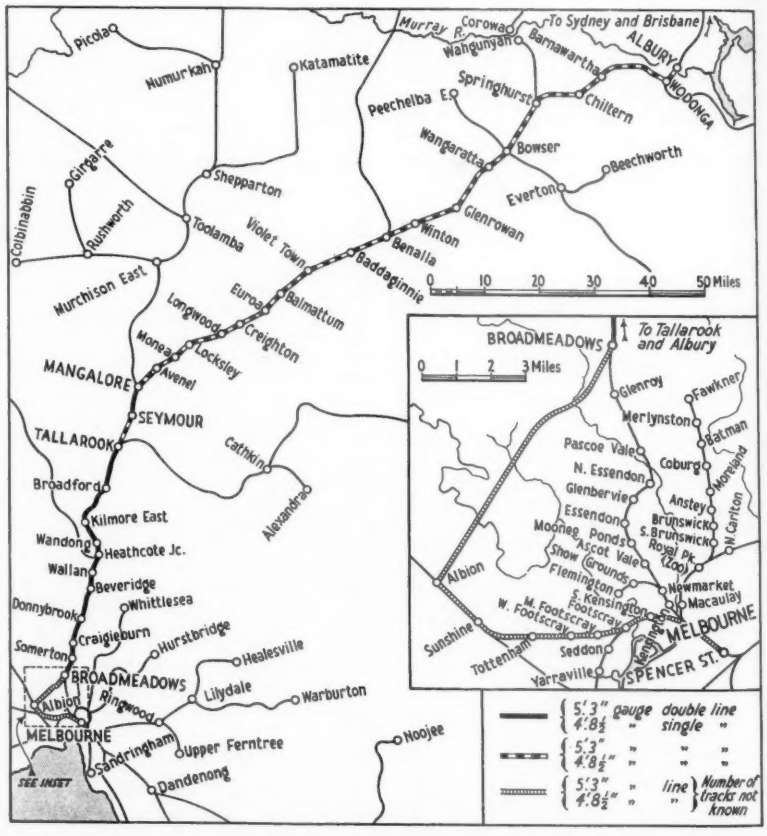
At Mangalore the double track from Melbourne ends, and the line is single for the remaining 122 miles to Albury. There are extensive marshalling yards between Seymour and Mangalore.

Branch lines are of some interest in relation to the proposals if they leave the present main line from the side on which the new standard gauge track is to be constructed and so cut across it. It will be a question of a physical crossing of 5-ft. 3-in. gauge track with a 4-ft. 8½-in. gauge main line, or the construction of a separate under- or over-pass in each case. Between Mangalore and Albury there are three branch lines leaving the north-western or down side of the main track and two leaving the eastern or up side.

Those on the northern side are the Benalla - Yarrawonga, Wangaratta - Peechelba, and Springhurst-Wahgunyah branches, while those on the south-eastern side are the Wangaratta-Beechworth-Bright and the Wodonga-Cudgewa branches. It will be noted that a point styled Bowser on the main line is the physical junction of the two branches worked from Wangaratta.

Albury to Wodonga

Wodonga is the last station in Victoria which is passed on the journey from Melbourne to Albury. Two miles



Victorian Railways main line from Melbourne to Albury (N.S.W.) with the Melbourne suburban area inset showing proposed 4-ft. 8½-in. gauge lines

Murray River Bridge between Albury and Wodonga showing (left) 5-ft. 3-in. gauge and (right) standard gauge line

further north the track crosses a bridge over the Murray River, which marks the border between the two States and enters New South Wales. Albury is only a short distance from the border. For many years there have been two tracks between Albury and Wodonga. One is the 5-ft. 3-in. gauge main line to and from Melbourne, and the other is a standard gauge line connecting the freight yards at Albury with those at Wodonga. This allows New South Wales trains to run into Wodonga. They are chiefly coal and live stock trains.

There are extensive transfer sidings at Wodonga located in two separate areas. One consists of the goods sidings in the immediate vicinity of the station, and the other is a transfer and marshalling yard about a mile north of Wodonga but on the Victorian side of the river.

Mixed-Gauge Yards

Mixed-gauge railway yards possess certain inconveniences in working, and this may be well illustrated by taking an example of a standard gauge train from New South Wales whose destination is the livestock siding at Wodonga for the purpose of loading or unloading livestock. This siding is 100 yd. or so beyond the station there, and on the eastern or "up" side of the yard, facing Melbourne. It can be used by trains of both gauges and forms the most southerly point to which New South Wales trains can travel into Victoria.

When leaving Albury for Wodonga, the standard gauge track is also on the up side of the main line to Melbourne, but just before it enters the station yards at Wodonga it crosses the 5-ft. 3-in. gauge track to the down side. Thus a standard gauge train, having left Albury on the up side of the main line, would enter the Wodonga yards on the down side, and after passing through for a short distance, has to cross 5-ft. 3-in. gauge Victorian tracks to reach the livestock siding on the up side of the yard. In this movement it has crossed and re-crossed the main line to Melbourne. In addition, the Victorian sidings in the yard at Wodonga must be kept clear of rolling stock at the time a standard gauge train is due to cross them.

Transfer Arrangements at Albury

The platform at Albury is 865 ft. long and is covered for its entire length. One side is used by the Victorian Railways, and the other and longer side by the New South Wales Railways trains. Daily since the line between Sydney and Melbourne was opened in 1883, passengers have crossed from one train to another. A special staff transfers the mail and baggage.

Goods trains of both gauges are run alongside each other in the yards at Albury and transfers made from one set of wagons to another. The transferring of goods and passengers keeps more than 420 men employed, and is Albury's biggest industry. Wages for the 100 permanent and 328 casuals amount to more than £350,000 a year, and authorities have calculated the total cost of break of gauge is about £800,000.

Locomotives for shunting 5-ft. 3-in. gauge wagons are supplied from Wodonga. In addition, expresses working between Melbourne and Albury, after arriving at the latter place and discharging their passengers, have to be taken back to Wodonga for turning. The journey to Wodonga amounts to an extra eight miles of running.

The turning procedure involves backing the express sets northward out of the Wodonga yard along the Cudgewa branch line. Having reached the required point, the locomotive and coaches then go forward again over a loop which connects with the main line, and they continue the forward movement to Albury.

The Victorian Railways provide a continuous service of pilot locomotives for the purpose of transferring passenger coaches and freight wagons as required between Wodonga and Albury. It can be seen, therefore, that a standard gauge line permitting a through service between Melbourne and Sydney has obvious advantages.

Wentworth Report

The Wentworth Report shows that consideration was given to three alternative ways of dealing with the Melbourne-Albury line. Briefly they were:—(1) to convert the existing line and branches; (2) to lay a third rail on existing track for use by trains of both gauges; (3) to build a standard-gauge

Railway yards at Wodonga (Victoria); the line coming from the left and crossing all tracks is a standard-gauge track from Albury

line alongside the existing 5-ft. 3-in. one.

The report shows preference for the third course, and states that this preference is shared by the Victorian Railways. One of the main reasons for this is that it is anticipated that considerably increased traffic can be expected after conversion to standard gauge, and that one single line would not be able to cope with both interstate and Victorian trains.

The committee proposes that it should be effected by converting one of the existing tracks of the double line from Broadmeadows to Mangalore and the construction of an additional 4-ft. 8½-in. gauge track alongside the 5-ft. 3-in. gauge single track from Mangalore to Wodonga.

Melbourne Suburban Area

There is at present an avoiding line from Albion to Broadmeadows used for goods traffic only. Goods trains travelling from Melbourne reach this by passing through the western suburbs of Footscray and Sunshine, and are switched on to it at Albion. On reaching Broadmeadows, they join the main north-eastern line to Albury. It is proposed that future standard-gauge trains would be provided for on this route rather than on the direct one to Broadmeadows used for all suburban and long-distance passenger trains. For part of the way through the western suburbs a special goods line will be used. Standard-gauge freight traffic will be provided for at the Dynon goods yards near North Melbourne.

Financing Project

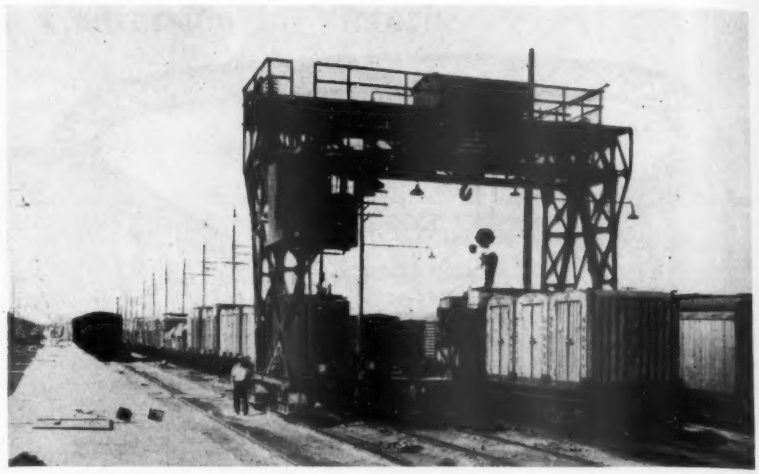
The cost of conversion is estimated to be £10 million, £4½ million for the Melbourne-Mangalore section and £5½ million for the Mangalore-Wodonga section. The Commonwealth Government has offered to provide 70 per cent of the cost, and the remaining 30 per cent is to be shared by the Governments of New South Wales and Victoria. The Commonwealth will lend the States the 30 per cent payable over a period of more than 50 years.

The elimination of the break of gauge at Albury is expected to save £800,000 in transfer costs, and also to attract £5 million worth of new business for the railways.

The estimated time for the project is four years, although it is hoped that it may be possible to improve on this. It has been suggested that it may be done in two-and-a-half years.

It is expected that a labour force of 250 will be employed during this financial year, rising to 750 the following year, and 1,500 in each of the following two years.

The project will take about 27,000 tons of rail, 450,000 sleepers, 650,000 cu. yd. of ballast, and 4,500 tons of bridging steel. Between Broadmeadows and Wodonga about 1½ million cu. yd. of earth will have to be moved, the deepest cutting being about 34 ft. and the highest bank 25 ft., between Mangalore and Avenel.



Transfer equipment in the yards at Albury alongside transfer platforms from Victorian to New South Wales trains

Proposals for New Tracks

Originally it was proposed to convert one of the existing tracks of the double line between Broadmeadows and Mangalore, and this was a recommendation in the Wentworth Report.

However, investigation of traffic on the North-Eastern and Goulburn Valley lines has shown that this would cause a deterioration in train services within Victoria. Therefore, to avoid this, a third track is being planned between Broadmeadows and Tallarook. Near the Goulburn River, between Tallarook and Seymour, the present up line will be converted to standard gauge to avoid the necessity for another bridge.

From the Seymour side of the Goulburn bridge a new track will be built to Wodonga. This means that there will be three tracks between Broadmeadows and Mangalore, except for the short stretch between Tallarook and Seymour, and two tracks between Mangalore and Wodonga. The existing standard gauge track between Wodonga and Albury will be used.

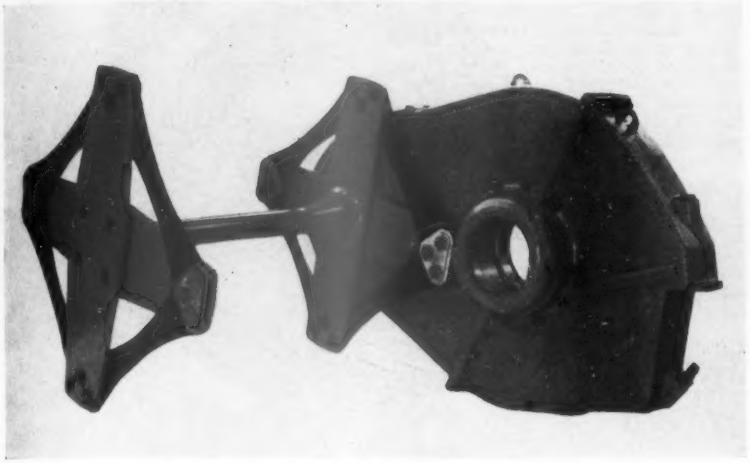
Regrading of the present railway has been considered, but investigation has proved that this would be too costly. All cuttings and embankments of the present line will have to be widened. Only minor alterations will be needed to most station yards, but major alterations will be needed at large stations such as Seymour, Benalla, and Wodonga. Buildings and approaches to

(*Continued on page* 688)

Victorian Railways up Albury express being signalled out of Albury by the New South Wales Railways

Cardan Drive with Plate Spring Couplings

Shaft and two universal joints accommodated within width of bogie



Couplings and cardan shaft of Sécheron drive

IN applying a cardan shaft drive to motor bogies, three main methods are used for obtaining a shaft of sufficient length within the limits set by bogie wheelbase or rail gauge. The motors may be mounted longitudinally, but this involves a final right-angle drive such as the pinion and hypoid gear in the Toronto Subway rolling stock. In order to retain the usual arrangement of transverse-mounted motors with the normal forms of pinion and gearwheel, the cardan shaft must also run transversely, which means for practical purposes that it must either pass through a hollow armature shaft in the motor, or must itself be hollow and enclose the driving axle. In either case, the universal couplings at each end of the cardan shaft must occupy the minimum possible space axially.

A type of cardan shaft and coupling now being used in a number of locomotives and motor coaches on the Continent is the Sécheron drive. This form of transmission is similar to the Brown-Boveri disc drive in that the cardan shaft runs inside the motor armature shaft, and couples the latter to the pinion in a separately-mounted gearcase; but instead of taking the form of a flexible disc, each universal joint consists of four plate-spring links between driving and driven members. Each link may be a single element, or be composed of several plates forming a laminated spring, according to the torque to be transmitted.

Location Inside Motor Armature Shaft

The location of the cardan shaft inside the motor armature shaft gives certain characteristics which are claimed to offset the restriction of this form of drive to motors specially designed to accommodate it. Clearance below the gearcase can be as small as with an axle-hung motor, as the end of the gearcase which houses the large gearwheel is carried on the axle by suspension bearings and does not move independently with the springs. The driving pinion can be of small diameter; instead of being mounted on the end of the armature shaft, it is supported on both sides by bearings of its own. Finally, in the absence of a cardan shaft enclosing the driving axle, of sufficient diameter to allow the necessary clearance for axle movements, a small centre-to-centre distance is possible between the motor shaft and the axle. These features facilitate the installation of motors of the maximum horsepower for a given wheel diameter.

The Sécheron cardan shaft itself is of circular section, and its diameter is slightly enlarged at each end. The end faces carry groups of projecting teeth which correspond with similar teeth on the driving and driven elements of the universal couplings, forming joints which can be separated more easily than those in which pinions or couplings are pressed or shrunk on to shafts. The same type of joint is used between the coupling and the pinion. As a precaution against damage to the motor by overspeed if the cardan shaft should break, projections from the end of the armature nearest the pinion would in those circumstances make contact with the final coupling and transmit the drive direct.

Universal Coupling

The Sécheron universal coupling consists of four spring elements forming a quadrilateral. At two opposite corners of the quadrilateral the springs are fixed rigidly to the member on the driving shaft, and at the other two corners to the member on the driven shaft. In the form of drive described in this article, therefore, one coupling is interposed between the armature shaft and the cardan shaft, and the second coupling between the cardan shaft and the pinion. All the springs are completely rigid in the direction of rotation but have good flexibility in other directions to allow for relative, including axial, movements of the coupled shafts. The springs are

Pinion, showing form of joint with coupling

exposed to moisture and dirt and are therefore rust-proofed. No lubrication or maintenance are required, there being no rubbing or wearing surfaces.

The first application of the Sécheron plate spring drive was made in a motor coach of the Vereinigte Huttwil-Bahnen, and this equipment has now covered some 622,000 miles without any form of mishap. The same system was chosen for the three 2,000-h.p. motor coaches delivered in 1953 and 1955 to the Berne-Neuchâtel, and Gürbetal-Berne-Schwarzenburg Railways, which were the most powerful vehicles of their type for a single-phase electrification and were required to haul international express stock between Neuchâtel and Berne as well as to work local trains with frequent stops. Other motor coach installations have been in 26 of the 30 high-speed sets for the Austrian Federal Railways described in our July 5, 1957, issue and in 12 motor brake vans for the same system. Recent locomotives equipped with this form of Sécheron drive include the mixed-traffic Co-Co now being built in large numbers for the 3,000-V. d.c. electrified system of the Czechoslovak State Railways.

Coupling element and projections on armature which take up drive if the cardan shaft breaks

Gauge Conversion in Victoria

(*Concluded from page* 686)

them, and some railway residences will have to be moved to make room for the new track.

There are three major works associated with the project. These are: (1) installation of centralised traffic control with power-operated signals; (2) bridge construction; and (3) alterations in the metropolitan area.

Power Signalling

Automatic power signalling with centralised traffic control is planned for the new railway. The main advantage of this being that it enables trains travelling at speed to be crossed automatically at unattended crossing loops or stations with perfect safety. To allow trains running on standard gauge track to pass each other, crossing loops will be built at intervals. These will be outside station yards so as to avoid interference with traffic working in existing yards.

Bridge Construction

About 14,00 ft. of bridging will be needed to widen existing bridges. All existing bridges, except those of the Goulburn River and its overflows between Tallarook and Seymour, will have to be widened. The railway bridge over the Broken River at Benalla is 800 ft. long, and the Ovens River Bridge at Wangaratta is 700 ft. Other large bridges span the Hughes Creek at Avenel, Seven Creeks at Euroa, and Reedy Creek at Wangaratta. Results of test bores to determine foundation conditions for bridges in the Wangaratta area have been sent to the Melbourne Technical College for analysis, so that scientific advice may be obtained in selecting the most suitable type of bridge foundations to adopt. Work has started on abutments for certain new bridges and filling will be placed against them when earth works begin. Some bridge construction will be done by private contract. About 20 bridges in all are concerned.

Alterations in Melbourne Area

A considerable amount of work will have to be done in the Melbourne terminal area for the standard track to be brought through the metropolitan network.

The goods terminal for the new line will be located near the Dynon Road Goods Yard, and the passenger terminal at Spencer Street Station. Details of work on tracks and signals in the Melbourne area have not yet been planned.

ENGLISH ELECTRIC CO. LTD. BIRMINGHAM OFFICE CHANGE OF ADDRESS.—The Birmingham branch of the English Electric Co. Ltd. has been moved from 75, New Street, to larger premises at Pitmaston, Moseley, Birmingham, 13 (tel. South 4021/5).

B.T.C. COMMERCIAL ADVERTISING SERVICE: OPENING OF NEW OFFICES IN BIRMINGHAM AND EXETER.—The British Transport Commission Commercial Advertising Service formally opened new offices at 65, New Street, Birmingham, on June 12. These replace former premises at Birmingham Snow Hill Station. They provide a more convenient centre at which advertisers can book and obtain information about B.T.C. road and rail advertising sites on a national, as well as local, basis. To mark the formal opening, representatives of advertisers and advertising agents were invited to a reception at the Queen's Hotel, Birmingham, where they were received by Mr. George Dodson-Wells, Chief Commercial Advertising Officer of the Commission, and his local representative Mr. W. A. Pike. On June 24, new and more central offices will also be formally opened by the B.T.C. Commercial Advertising Service at 246, High Street, Exeter, to replace their previous offices at Exeter Central Station.

TIMBER DEVELOPMENT ASSOCIATION ANNUAL REPORT, 1957.—One section of the 24th annual report of the Timber Development Association deals with research activities at the Association laboratories at Tylers Green, Bucks; this includes a note of studies on shell roof structures. Other sections are concerned with the growth of the T.D.A. Approved Manufacturers scheme, increased activity in the regions, educational facilities, and the growth in the volume of work handled by the advisory and design services of the Association.

C.I.M.A.C. BRITISH NATIONAL COMMITTEE.—The report of the British National Committee of the International Congress on Combustion Engines (C.I.M.A.C.) will be submitted to a general meeting of supporters to be held at Brown's Hotel, Dover Street, London, S.W.1, on June 18. Mr. W. K. G. Allen will take the chair. The report is concerned with the Fourth International C.I.M.A.C. Congress held at Zurich last year, the Fifth Congress to be held in Wiesbaden in 1959, meetings of the Permanent Committee, and finance.

RAILWAY NEWS SECTION

PERSONAL

Mr. W. T. P. Perkins, General Manager, Sierra Leone Government Railway, has retired. Mr. S. D. M. Robertson, Chief Engineer, is acting as General Manager of the railway.

Mr. Norman Quail, Commissioner, Victorian Government Railways, who, as recorded in our May 23 issue, has been appointed Deputy Chairman of that system, began his railway career in 1910, as a junior clerk in the Transportation Branch. He later transferred to the Electrical Engineering Branch. During the 1914-18 war, he was commissioned in the First Australian Imperial Force. While serving in France he was awarded the Military Cross. Shortly after demobilisation, he became Personal Clerk to the Chief Electrical Engineer, and later Staff Clerk of the Branch. He was subsequently transferred to the Secretary's Branch, as Senior Clerk to the Staff Board. After holding a number of senior staff positions, he became Chairman of the Staff Board in 1947. Mr. Quail was appointed Secretary for Railways in 1949, and Commissioner in 1956.

Mr. Norman Quail
Appointed Deputy Chairman, Victorian Government Railways

Mr. T. E. Chrimes
Motive Power Superintendent, Southern Region, British Railways 1944-58

Sir Denys Lowson has joined the board of the Algoma Central & Hudson Bay Railway Company. He has accordingly resigned from the joint bondholders committee of the company.

Mr. T. E. Chrimes, M.I.Mech.E., M.I.Loco.E., M.Int.T., who, as recorded in our May 30 issue, has retired as Motive Power Superintendent, Southern Region, British Railways, began his career in 1910 on the former London Brighton & South Coast Railway as a pupil. In 1913 he was appointed Assistant Foreman, New Cross Depot, and later became Locomotive Foreman at Eastbourne and St. Leonards. Mr. Chrimes served with the Royal Naval Air Service and Royal Air Force during the 1914-18 war. In 1921 he became District Locomotive Superintendent, Battersea. On grouping in 1923 he was appointed Assistant Eastern Divisional Locomotive Running Superintendent at Waterloo. At the outbreak of the 1939-45 war, Mr. Chrimes was appointed Central Divisional Locomotive Running Superintendent and continued in that office until May, 1942, when he became Assistant to the Locomotive Running Superintendent. He was appointed Superintendent of Motive Power in 1944, the designation of the appointment being changed to Motive Power Superintendent four years later.

Mr. A. H. Earley has resumed his duties as Chief Ports Manager, East African Railways & Harbours on return from six months in the Far East where, at the request of the World Bank in Washington, he took part in an economic survey.

Lord Broughshane has been appointed a Director of the Salvador Railway Co. Ltd.

The French National Railways announce the following changes:—Mr. Charles Boyaux has resigned as Director General, and has been appointed Director General "Honoraire." As Vice-President of Cie. P.L.M. he is on the board of S.N.C.F. Mr. Phillipe Dargeou, Senior Director General Adjoint, has been appointed Director General. Mr. F. Hébert, Junior Director General Adjoint, becomes Senior Director General Adjoint. Mr. Roger Guibert, Director, Région de L'Ouest, becomes Junior Director General Adjoint.

Last week, through a misunderstanding, we stated that Mr. K. Kaul, General Manager, Northern Railway of India, had retired. Mr. Kaul has in fact been appointed General Manager of the Western Railway of India.

Mr. Kenneth D'Alby, Assistant Dock Superintendent, Middlesbrough Docks, British Transport Docks, has been appointed Docks Manager at Barrow and Silloth. He succeeds the late Mr. J. G. Thomas.

Mr. T. J. Oliver, Kent County Civil Defence Officer since 1955, has been appointed chief of the Port of London Authority Police Force.

Mr. J. W. Read

Appointed Assistant Director, Accounts, British Transport Commission

Mr. J. R. Palmer

Appointed Assistant Traffic Manager, Malayan Railway

Mr. L. H. Joslin

Appointed Assistant to Commercial Officer (Mineral), Eastern Region

Mr. J. W. Read, Senior Budgets Assistant, British Transport Commission, who, as recorded in our June 6 issue, has been appointed an Assistant Director of Accounts, Accounts & Statistics Division, joined the Great Western Railway in 1929, in the Chief Accountant's Office. In 1936 he attended a course of special training in the administrative and accounting procedures of the Passenger, Freight, Civil and Mechanical Engineering Departments, and in 1940 joined the Accountant Branch of the Royal Air Force. He was demobilised with the rank of Flight Lieutenant in 1946, when he returned to the Chief Accountant's Office. On nationalisation, he became Secretary of the Railway Accountants' General Expenditure Sub-Committee, and in 1948 was transferred to the Comptroller's Department, British Transport Commission, as Assistant to the Director of Accounts. He was appointed Senior Budgets Assistant in 1953. Mr. Read is an Associate Member of the Association of Certified & Corporate Accountants, and a Director of East Midland Motor Services Limited and of the Trent Motor Traction Co. Ltd.

Mr. James C. Jones, General Manager of the Paraguay Central Railway, is at present in England on leave.

We regret to record the death on June 5, at the age of 78, of Mr. G. D. Shepherd, former President of the Institute of Chartered Accountants. Mr. Shepherd was one of a panel, appointed in 1947, to apportion funds in connection with Argentine Railways. In 1948, he discharged a similar responsibility on the Uruguay Railways.

Mr. Ronald Wade, Assistant Traffic Manager, Cumberland Motor Services Limited, Whitehaven, has been appointed Assistant Traffic Manager, Eastern National Omnibus Co. Ltd., Chelmsford. He succeeds Mr. L. J. Quilter who was recently appointed Traffic Manager of that company.

Mr. E. W. Farr has been appointed a director of Hackbridge Holdings Limited.

Mr. J. R. Palmer, who, as recorded in our March 28 issue, has been appointed Assistant Traffic Manager, Malayan Railway, joined the Southern Railway in 1928. He served in the London District Freight Office, the London West District Office and the Commercial Superintendent's Office of that system. Commissioned in the Supplementary Reserve, Royal Engineers, in 1939, he served in the army until 1946. He was awarded the M.B.E. and Belgian Croix Militaire. On demobilisation he served with the Control Commission. He joined the Malayan Railway in 1948 and has served successively as Assistant Traffic Superintendent, Tumpat; Senior Assistant Traffic Superintendent, Port Swettenham; Traffic Manager's Staff Officer, and District Traffic Superintendent, Prai, the position he relinquished to take up his present appointment.

Mr. G. S. McDonald has been elected President of the Institution of Structural Engineers. He will take office in October.

Vice-Admiral Sir Frank Mason has been appointed Chairman of the Mechanical Engineering Research Board. He succeeds Sir Andrew McCance, who is retiring.

Vickers Limited announces the following changes in organisation:—

Mr. E. J. Waddington has resigned from the boards of Vickers-Armstrongs (Aircraft) Limited, Vickers-Armstrongs (Engineers) Limited, Vickers-Armstrongs (Shipbuilders) Limited and Vickers-Armstrongs (Tractors) Limited.

Mr. J. H. Robbie, a Director of Vickers-Armstrongs (Engineers) Limited, has been appointed an additional member of the board of Vickers-Armstrongs (Aircraft) Limited, Vickers-Armstrongs (Shipbuilders) Limited and Vickers-Armstrongs (Tractors) Limited. He has also been appointed Controller of Finance, Vickers Limited and Vickers-Armstrongs Limited.

Mr. B. L. Scott has been appointed Manager of the Newcastle-upon-Tyne Branch Office of George Ellison Limited, in succession to Mr. J. Gibbins, who has retired after 46 years' service with the company.

Mr. L. H. Joslin, Chief Clerk, Line Traffic Manager's Office, Great Eastern Line, Eastern Region, British Railways, who, as recorded in our May 30 issue, has been appointed Assistant to the Commercial Officer (Mineral), Eastern Region, joined the former L.N.E.R. in 1924. Some five years later, after serving at a number of stations, he entered the District Commercial Superintendent's Office at Ipswich. In 1935 he was transferred to the Southern Area Goods Manager's staff, Liverpool Street, to conduct staffing enquiries at stations. In 1939 Mr. Joslin joined the Goods Manager's Special Enquiry Section, dealing with changes in station organisation, methods and accountancy for the release of staff to H.M. Forces. In 1945 he was moved to the Goods Manager's & Passenger Manager's Joint Staff Section. In 1947 Mr. Joslin became Deputy Head, Goods Manager's General Section. In 1948 he was appointed Deputy Head, Goods Claims Section. In 1952, when the Goods and Passenger Claims Sections were merged, he became Deputy Claims Assistant. Mr. Joslin was Acting Claims Assistant from November, 1956, until April, 1957, when he was appointed Chief Clerk to the Line Traffic Manager (Great Eastern).

Mr. J. Bell has been appointed Manager of the General Electric Company's research laboratories at Wembley. Mr. Bell, who has been manager of the Telecommunications Division of the Wembley laboratories since 1953, retains the leadership of this work in addition to his new appointment.

Sir Henry Spurrier, Chairman & Managing Director of Leyland Motors Limited, and Mr. A. E. Pearce, Director of Qualcast Limited, have been appointed part-time members of the Iron & Steel Board. Sir Henry Spurrier has relinquished his position as chairman of Scammell Lorries Limited but will retain his seat on the board.

Dr. R. F. Goldstein, Managing Director, British Oxygen Chemicals Limited, has been appointed also Managing Director of Carbide Industries Limited and a Director of Odda Smelteverk.

The Indian Railway Board announces the following appointments:—

Mr. A. H. Alwyn, Chief Engineer (Steamship), Southern Railway, as Marine Engineer (Steamship), North Eastern Railway.

Mr. Harbans Singh, Acting Chief Operating Superintendent, North Eastern Railway, as Senior Deputy General Manager, Northern Railway.

Mr. D. B. Patel, Acting Senior Deputy General Manager, Southern Railway, as Acting Chief Operating Superintendent, North Eastern Railway.

Mr. S. N. Barua, Acting Regional Superintendent, North-East Frontier Railway, as Acting Senior Deputy General Manager, Southern Railway.

Mr. M. M. Khan, Chief Mechanical Engineer, North Eastern Railway, as Acting Senior Deputy General Manager, Western Railway.

Mr. E. G. Kotiswaran, Divisional Superintendent (A.), Central Railway, as Acting Chief Mechanical Engineer, North Eastern Railway.

Mr. A. N. Mukherjee, Deputy Chief Mechanical Engineer, Eastern Railway, as Acting Chief Mechanical Engineer, Chittaranjan Works.

Mr. B. B. Dutta, Acting Deputy Chief Engineer, South Eastern Railway, as Acting Divisional Superintendent, Eastern Railway.

Mr. D. B. Singh, Divisional Superintendent (I.A.), Northern Railway, as Engineer-in-Chief, Metre Gauge Factory & Locomotive Component Works Project.

Mr. M. A. Qadeer, Acting Regional Superintendent, South Eastern Railway, as Acting Director, Establishment, Railway Board Headquarters.

Mr. K. K. Mukherjee, Acting Deputy Chief Operating Superintendent, Eastern Railway, as Acting Regional Superintendent, South Eastern Railway.

Mr. D. P. Mathur, Member-Secretary Expert Committee on Coal Consumption, Railway Board, as Senior Deputy General Manager, Central Railway.

Mr. M. A. Rao, Acting Senior Deputy General Manager, Central Railway, as Acting Senior Deputy General Manager, Eastern Railway.

Mr. Ramesh Chandra, D.E.N., North Eastern Railway, as Acting Deputy Chief Engineer, North-East Frontier Railway.

Mr. Inder Singh, Acting Deputy Chief Engineer, North-East Frontier Railway, as Acting Deputy Chief Mechanical Engineer, North Eastern Railway.

Mr. T. V. Joseph, District Engineer, South Eastern Railway, as Deputy Chief Engineer, North-East Frontier Railway.

Mr. S. V. Nayak, Acting Deputy Chief Engineer, Southern Railway, as Acting Chief Engineer, in place of Mr. D. R. Kohli, proceeding on leave.

Mr. M. S. Gill, Acting Deputy Chief Accounts Officer, North Eastern Railway, as Acting Deputy Chief Accounts Officer, North-East Frontier Railway.

Mr. S. Krishnan, Senior Scale Officer, Traffic (Transportation) & Commercial Department, South Eastern Railway, as Deputy Chief Commercial Superintendent on that railway.

Mr. S. G. Krishnan, Mining Adviser, Eastern Railway, as Chief Mining Adviser, Junior Administrative Grade.

The following transfers are also announced by the Railway Board:—

Mr. M. K. Menon, Secretary, Railway Service Commission, Allahabad, has been transferred to Railway Service Commission, Calcutta.

Mr. T. Sadasivan, Secretary, Railway Service Commission, Calcutta, has been transferred to the Northern Railway.

Birthday Honours List

The following is a selection of Birthday Honours of transport interest:—

G.B.E.

Lord Citrine, Formerly General Secretary, T.U.C.

C.V.O.

Mr. S. G. Hearn, Assistant General Manager (Traffic), Eastern Region, British Railways.

Knight Bachelor

Mr. W. R. Black, Chairman National Research Development Association.

Professor Willis Jackson, Director, Research & Education, Metropolitan-Vickers Electrical Co. Ltd.

C.B.E.

Mr. James Amos, Chairman, Scottish Omnibus Group, B.T.C.

Mr. T. W. F. Brown, Director, Parsons & Marine Engineering Research & Development Association.

Mr. F. S. Snow, Snow & Partners, Consulting Engineers and Past President, Institution of Structural Engineers.

Mr. F. Williamson, Chairman, Traffic Commissioners, North Western Traffic Area.

O.B.E.

Mr. E. D. Fryer, Chief Executive Officer, Ministry of Transport & Civil Aviation.

Mr. W. J. Lardner, Stores Superintendent, East African Railways & Harbours.

Mr. P. H. D. Tennant, Overseas Director, Federation of British Industries.

Mr. H. A. Tunstall, Assistant Research Manager. Henley's Telegraph Workshops Co. Ltd.

Mr. A. W. Woodbridge, Signal Engineer, Western Region, British Railways, Past President, Institution of Signal Engineers.

M.B.E.

Mr. H. W. Price, Stationmaster, Birmingham, London Midland Region, British Railways.

Mr. J. L. D'Espagnac, Engineer, Mauritius Government Railways.

Mr. J. V. Martins, Chief Civil Engineer, Transport & Harbours Department, British Guiana.

Mr. M. H. Shah, Chief Goods Clerk, East African Railways & Harbours.

Mrs. A. L. Stafford, Hotel Manageress, East African Railways & Harbours.

Mr. W. L. Bonny, Bridge Engineer, Rhodesia Railways.

Mr. C. E. Butter, Higher Executive Officer, Ministry of Transport & Civil Aviation.

Mr. G. W. Chapman, Divisional Manager, Hudswell Clarke & Co. Ltd.

Mr. F. Fancutt, Assistant Director, Chemical Services, Research Department, British Railways Central Staff.

Mr. R. Gray, Chief Designer, Chloride Batteries Limited.

Mr. F. W. Thorn, Principal, Training College, Rhodesia Railways.

B.E.M.

Mr. P. F. Brooks, Yard Foreman, Exmouth Junction, Southern Region, British Railways.

Mr. J. Gilhooley, Driver, London Midland Region, British Railways.

Mr. T. J. Griffiths, Inspector Mechanical, West Ealing, Western Region, British Railways.

Mr. W. Horsfield, Hostel Manager, Eastern Region, British Railways.

Mr. S. Lomas, Traffic Inspector, British Transport Waterways.

Mr. E. W. Porter, Driver, Eastern Region, British Railways.

Mr. R. W. Pumphrey, Chargehand Mason, North Eastern Region, British Railways.

Mr. A. T. Wyatt, General Assistant, Personal Service Branch, Pullman Car Company.

Lt.-Commander G. W. Wells, Managing Director (Engineering Works), United Steel Companies Limited, has been appointed Managing Director (Production) responsible to the General Managing Director, Mr. A. J. Peech. Lt.-Commander Wells will continue as General Manager, Appleby-Frodingham Steel Co. Ltd. Mr. A. Jackson will relinquish his position as General Works Manager, Appleby-Frodingham Steel Co. Ltd., to become Technical Adviser on steelmaking for United Steel Companies Limited, responsible to Lt.-Commander Wells. He will also join the boards of Steel, Peech & Tozer, Samuel Fox & Co. Ltd., and Workington Iron & Steel Company. Mr. J. D. Joy will relinquish his position of General Works Manager at Samuel Fox & Co. Ltd., on August 31 and will move to Appleby-Frodingham as a Director & General Works Manager with a view to becoming Deputy General Manager on January 1, 1959.

The newly-appointed Argentine Under Secretary of Transport, Dr. Lõpez Abuin, has named Dr. José Luis Salmerón and Dr. Hugo Piñero as his assistants.

Mr. G. V. Palmer has been elected Chairman of Council, Institute of Export.

Sir Herbert Brittain has been appointed Chairman of the Iron & Steel Holding & Realisation Agency in succession to the late Sir John Morison.

Mr. Collin L. G. Baker has been appointed a Director of George Angus & Co. Ltd. He had been Secretary and Financial Controller of that company since 1950.

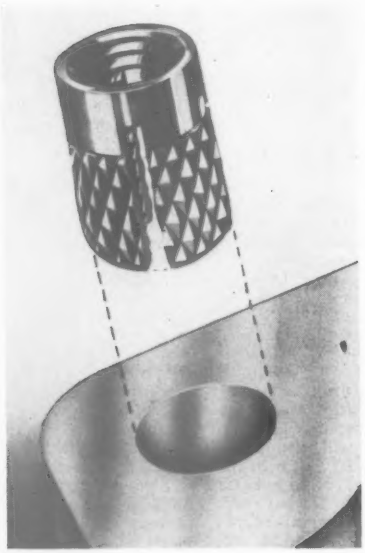
Mr. W. J. Morgan is retiring as General Manager, Machine Tool Trades Association, but will continue in a non-executive capacity as advisor. Mr. H. O. Barret will assume the overall responsibility of the Association's affairs.

Simms Motor units Limited announce the following appointments:—Mr. K. K. Cotterell as Assistant Branch Manager of the newly-formed Nottingham Branch, and Mr. D. Crawford as Assistant Service Manager; Mr. J. Howard as Development Engineer in charge of the Fuel Injection Laboratory; Mr. L. Albon as Senior Fuel Injection Installation Engineer.

Following his election as Chairman of British & Commonwealth Shipping Co. Ltd., in succession to the late Lord Rotherwick, Sir Nicholas Cayzer has found it necessary to relinquish his directorship in Associated Electrical Industries Limited.

Mr. W. Newland, Associate Director in control of export, Simms Motor Units Limited, is on a business visit to Spain and Portugal. Mr. H. J. Stoneman, Service Manager of that company, shortly will make an extended tour of Scandinavia.

NEW EQUIPMENT AND PROCESSES



Self-Locking Screwed Inserts

BANC-LOC self-locking inserts suitable for use in wood, plastics, castings, moulded parts and so on, are now available in this country. Hitherto they have been manufactured in the U.S.A., but are now to be made under licence.

The parts are available in aluminium, brass, steel and stainless steel in a wide range of sizes and designs. By eliminating the laborious task of positioning inserts in moulds, their application has helped to reduce costs of many plastic products. They have gained wide acceptance in eliminating costly tapping operations and extra locking devices and can be used for salvage of stripped threads.

The pieces are simply pressed into the hole, without the use of special tools. The screw is firmly retained by the self-locking action of the insert. They can be inserted into plastic mouldings after the mouldings are made, resulting in a substantial increase in mouldings production and eliminate damage to expensive moulds because of displaced inserts.

A range of standard sizes and types are in production; special designs for particular requirements can be made.

Full details of the Banc-loc self-locking inserts may be obtained from the manufacturer in this country, the Precision Screw & Manufacturing Co. Ltd., Union Street, Willenhall, Staffs.

Dry Bearing Materials

THREE dry bearing materials or processes have been introduced for various applications; in the railway engineering field these could include sliding door roller bushes and slides, diesel engine governors and controls, signal mechanisms, and electrical and mechanical switchgear.

One of these materials, known as DU, consists of a thin steel strip with a porous bronze coating impregnated with a mixture of a fluoro-carbon plastic (P.T.F.E.) and lead. This material provides three times the load/speed carrying capacity of the manufacturer's original DP material which it now supersedes. It can be used to provide long and trouble-free service to a wide variety of situations, where ordinary bearings would be troublesome.

P.T.F.E. (polytetraflouroethylene), is a plastic which possesses low-friction surface characteristics. It is stable from about −200° C. to +327° C. and is chemically inert, reacting with only a few rarely met substances.

A stock range of bushes, thrust washers and flat strip are available for manufacturers wishing to conduct their own experiments.

In some corrosive situations the steel backing may need special protective treatment, as by electroplating or, alternatively, another type of dry bearing, the DQ, may be more effective.

The DQ material is fluoro-carbon (P.T.F.E.) strengthened with special fillers and supplied in bars and tubes. Non-standards or irregularly shaped dry bearings can be simply machined from this material, supplied from stock in standard diameters. The filler, a mixture in itself, gives DQ good wear resistance and the rigidity necessary to prevent the plastic flow to which pure P.T.F.E. is susceptible under stress.

The material has a very low wear rate in dry rubbing contact with steel and is a suitable material for bearings or bearing surfaces operating without a lubricant and where the shape of the bearing cannot be formed from DU strip. Because of its machinability a great variety of parts can be made from it.

The third item is the DM process which is a surface treatment applied to ferrous and some other metals to provide them with good bearing properties when used as rubbing surfaces under dry or unlubricated conditions whilst supporting heavy unit loads.

It consists of a process for applying an adherent layer about 0·0015-0·0025 in. thick of a combination of fluoro-carbon and molybdenum disulphide to the bearing surfaces of customers' parts sent to the manufacturer for treatment. The accompanying illustration shows examples of products which make use of these processes.

Further details may be obtained from the Glacier Metal Co. Ltd., Alperton, Wembley, Middlesex.

Additives for Fuel Oils

THE action of Amber SSR 513, one of two new fuel oil additives, is to soften and break up the binders in carbon and lower its ignition point, thus preventing the formation of the hard deposits which commonly accumulate in compression ring grooves of diesel engines. As carbon is particularly absorbent to sulphur, the rate of sulphur attack on these parts will be reduced.

The compression ratio is maintained and unburnt fuel and combustion products are not carried past the piston to contaminate the lubricating oil in the sump. With the rapid build-up of carbon, using an untreated fuel, a sequence of reactions occurs, which considerably shortens the operational life of the diesel engine. Combustion is affected and efficiency falls with the formation of excessive carbon on injector nozzles, piston crowns, behind piston rings, in valve ports and exhaust ranges. These heavy deposits retard heat transfer giving rise to local "hot spots" causing unequal expansion, which results in distortion and abnormal wear. The cost of treatment approximates 0·13d. per gal. of diesel oil consumed.

Amber SSR 511, if added to heavy fuel oils in small quantities, will, it is claimed, reduce to a harmless level the formation of sludge during normal storage periods. The treatment is stated to be particularly effective in improving the stability of fuel oils made up of straight-run distillates and components produced in catalytic cracking units.

The insoluble residues which separate from fuel oils are mostly resins and sludge, which are formed during storage. They arise from the reaction of chemically unstable components with each other, and with oxygen from the atmosphere.

The product should be added to the fuel tank, via the filling line, before bunkering the oil. It acts to dissolve existing sludge in the tank and fuel system, retard the formation of further sludge, and generally improve atomisation and combustion of the fuel. The cost of

the treatment approximates 0·06d. per gal. of oil consumed.

The products are manufactured by the Amber Chemical Co. Ltd., 11A, Albemarle Street, London, W.1.

Powerful Fire Extinguisher

A FIRE extinguisher recently developed, the 30-lb. dry powder extinguisher, Model 1630, has been specially developed for use on fires involving highly inflammable liquids and electrical wiring and equipment. An example of the efficiency of the model is its ability to extinguish 250 sq. ft. of petrol flame in 28 sec. It is specially suitable on fires involving hot, heavy oils, tar or bitumen, as it causes no "boil-over" and it is claimed to be able to deal promptly with nearly any fire likely to be experienced in railway operation including wagons, compartments of coaches, workshops or depots.

Considerable research has led to the development of a powder that is a non-conductor of electricity, non-toxic, non-abrasive and non-corrosive. Unlike other powders, it is not liable to coagulation, and it cannot be affected by atmospheric moisture. It is also frost-proof down to −40° F.

The discharge nozzle of the model 1630 has been designed so that the powder is expelled in a horizontal fan-shaped cloud with an operational range of 25 ft. The operator can shelter behind this spray; the heat-proof properties of the powder, it is stated, enable him to get much closer to the flames than he has previously been able to do.

The extinguisher is practically fool-proof in use: it cannot be discharged accidentally, and it is used in the upright position. It is mobile, being normally installed with a quick-release, two-wheel lightweight trolley to ensure maximum speed of operation; economy and low maintenance have also been considered in its design. The special pressure gauge indicates whether the extinguisher contains sufficient pressure.

The total weight of the Model 1630 dry powder extinguisher is 59 lb. Further details may be obtained from the manufacturer, Nu-Swift Limited, Elland, Yorks.

Load Deflection Gauge

THE deflection of surface plates and tables, as well as machine tool beds, when subjected to a load, can cause considerable variation from their original flatness. Heavy components are frequently placed on surface tables which have been tested for flatness only under no-load conditions, and nothing is known about the deflection under load. A load deflection gauge has been designed to test such items.

The use of this gauge could be important whenever a heavy component is placed on a surface plate, to measure the deflection under load. which can then be taken into consideration for accurate gauging.

It consists of an aluminium beam comparator of rigid structure which is supported on two feet, each of which can be positioned along the length of the beam so that any size of surface plate, up to a maximum length of the beam comparator, can be tested. A third foot, which is positioned centrally along the beam and slightly offset, is provided to keep the beam stable. A dial gauge reading in

0·001 or 0·0001 in. with its contact tip pressed against the surface plate is rigidly clamped in the centre of the beam. A central weight support, comprising a platform for the requisite weights, is mounted independently of the beam, on a ring which permits the plunger of the dial gauge to press against the plate under test.

The gauge can also be used as a beam comparator for testing flatness of surface tables, machine beds, and so on. In this case, the weight support is removed and the dial gauge is set to zero on a master straight edge, or an accurate surface table. The feet can be adjusted to any convenient length and the gauge can then be used in the same manner as a block spirit level, the advantage being that instantaneous readings are obtained.

The gauge is supplied in three standard sizes of 3, 6 and 10 ft., but larger sizes can be obtained on application. These lengths represent the normal maximum capacities, but each model can be used for measuring from approximately 10 in. upwards, by positioning the two feet as required. This applies both to the gauge being used as a beam comparator as well as a load deflection tester. Each gauge is supplied with a specially dimensioned dial indicator, which can be obtained in two calibrations, viz., 0·001 in. and 0·0001 in.

Further details may be obtained from the manufacturer, Rubert & Co. Ltd., Chapel Street, Stockport Road, Levenshulme, Manchester, 19.

Nylon Tubing

A RANGE of nylon tubing has been developed for applications such as machine lubrication and hydraulic control lines. The tubing is of light-weight, tough, heat and ultra-violet light resisting material. Not only does the nylon tube cost less than non-ferrous tube but as it does not require pre-forming, installation costs can be cut by up to 50 per cent.

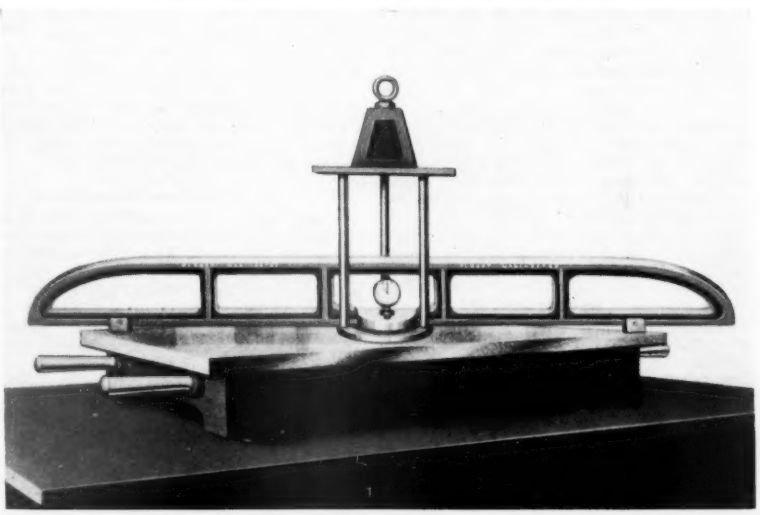
As distinct from ordinary nylon tubing this tube is precision extruded to fine limits from specially compounded polyamides.

Two types are available: the semi-rigid, TTR, which is very pliable and easy to install, and the flexible, TTF, which is stated to be superior in performance to many other types of flexible tubing. In both cases the tubing is practically indestructible.

The TTR nylon tubing is available in two grades, either high pressure with short time burst pressure rating of 2,500 lb. per sq. in. or low pressure with a short time burst pressure rating of 1,000 lb. per sq. in. Both grades are precision extruded to the limits of +0·000 in. to −0·003 in. or −0·005 in., according to outside diameter and are thus suitable for use with standard compression fittings. The semi-rigid tubing is available with a range of outside diameters varying between $\frac{1}{4}$-$\frac{3}{8}$ in.

The TTF flexible tubing with appropriate end fittings can replace rubber and other conventional flexible materials for a very wide range of purposes. The maximum working pressures depend on operating conditions. It is available with outside diameters of $\frac{3}{16}$ in. and $\frac{5}{16}$ in. Other sizes than those mentioned up to $\frac{1}{2}$ in. can be extruded for reasonable quantities.

The nylon tubing is manufactured by Tecalemit Limited, Plymouth, Devon.



Mechanical Equipment Standardisation Conference

Discussions of motive power and rolling stock questions by representatives of overseas railways

The Fifth Biennial London Conference on Standardisation of Railway Mechanical Equipment on Oversea Railways was held at Sanctuary Buildings, Westminster, S.W.1, on May 12-20, as recorded in our May 30 issue. The conference was convened by the Crown Agents for Oversea Governments & Administrations, who act as the secretariat and were responsible for the arrangements and the preparation of technical information and drawings.

The Malayan, Sierra Leone, and Sudan railway authorities regretted their inability to send representatives this year. The conference was attended by the following:—

East African Railways & Harbours: Mr. J. Hudson, Chief Mechanical Engineer;
Nigerian Railway Corporation: Mr. G. H. Binnie, Deputy Chief Mechanical Engineer;
Ghana Railway & Harbour Administration: Mr. G. B. W. Dominy, Deputy Chief Mechanical Engineer;
South African Railways: Mr. W. H. W. Maass, Advisory Engineer to the High Commissioner in the United Kingdom;
Rhodesia Railways: Mr. F. E. Hough and Mr. P. S. Palmer, Messrs. Freeman Fox & Partners;
Nyasaland Railways: Mr. Andrew Henderson, Messrs. Livesey & Henderson;
Locomotive & Allied Manufacturers' Association: Mr. G. T. Owen, Chairman; Mr. W. Pickett, Technical Assistant to the Director;
Railway Carriage & Wagon Building Association: Mr. N. Schofield, Chief Designer, Birmingham Railway, Carriage & Wagon Co. Ltd.;
British Standards Institution: Dr. E. L. Diamond, Divisional Chief Technical Officer.
Crown Agents: Members of technical staff.

The proceedings were opened by Sir Hilton Poynton, who welcomed the members and referred to the progress achieved since the last conference.

The chair was taken by Mr. R. W. Taylor, Engineer in Chief, Crown Agents, who in introducing the business session, mentioned that the conference was primarily one for actual users of railway mechanical equipment, and that the British Standards Institution and representatives of manufacturing industries in the United Kingdom had been invited to assist and advise in the deliberations of the users.

Mr. D. C. Brown, Chief Mechanical Engineer, Crown Agents, presented the report on the work of the secretariat since the 1956 conference, in which he drew attention to the fact that some of the standards put forward at previous conferences were now embodied in vehicles in service or on order. He then outlined the various measures which had been taken to implement the recommendations of the 1956 conference, and gave particulars of the work which had also been undertaken in the preparation of new detailed information for discussion at the Conference.

Agenda

The agenda, which covered a wide range of subjects, included:—

General:
- Crown Agents' specifications
- Tyre sizes, profiles, and methods of fixing
- Carriage and wagon wheels for 13- and 17-ton axleloads
- Roller bearing axleboxes and axle stub ends
- Brake shoes and holders
- Automatic couplers
- British Standards for non-ferrous castings

Carriages and Wagons
- Standard 17-ton axleload cast steel bogie
- Standard all-steel wagon body designs
- Proposed standard wagon body designs in aluminium alloy
- Building up of worn tyre flanges by welding
- Age limit for carriage axles
- Slack adjusters
- Carriage bogies
- Vestibule gangways

Diesel locomotives and railcars
- Design trends
- Transmission systems
- Position and layout of driver's controls
- Protective devices
- Braking systems
- Provision for multiple-unit working
- Voltage and fittings for auxiliary electrical equipment
- Colour coding for pipework

Each item was very fully discussed, and there was a considerable measure of agreement leading to reasonable decisions. Recommendations were made covering each item of the agenda.

On May 12, the Crown Agents held a reception in honour of the Conference members.

In the afternoon of May 14, a visit was made to the Acton works of C. A. V. Limited, where displays and demonstrations of automatic gear changing control, fuel injection equipment, a.c. generation, and other equipment manufactured by the company, were seen.

On May 19, members attended a cocktail party given by the Locomotive & Allied Manufacturers' Association.

Visits to Works

The Conference closed on May 20, and the members travelled to Scotland, where they visited the Falkirk rolling mills of the British Aluminium Co. Ltd., and saw the production of aluminium sheet and strip in various forms and in special finishes.

On May 22 members spent some hours at the Glasgow works of the North British Locomotive Co. Ltd., where 2,000- and 1,000-h.p. diesel-hydraulic and 1,000-h.p. diesel-electric locomotives for British Railways and several types of diesel shunting locomotives were seen in production.

Car-Carrying Ship for Larne/Stranraer Route

Transport of private motor cars and commercial vehicles throughout the year

The approval of the B.T.C. was considered last week by Lord Rusholme, Chairman of the London Midland Area Board and Members of the Commission, of the building of a vessel to operate on the Larne/Stranraer route with accommodation for motor vehicles. He was speaking at a luncheon at Belfast given by the Ulster Tourist Development Association.

Lord Rusholme said that for some time now there had been a growing demand for the provision of such a vessel. It had been felt that there should be a vessel on the service with a car rack so that year-round facilities could be provided for cars and commercial vehicles.

During last year, he added, British Railways carried 51,000 more passengers in the new steamers on the Belfast/Heysham service than in the previous year. Against that there was a decrease of 15,000 in the numbers travelling between Larne and Stranraer, but on both services 325,000 tons of cargo had been carried which was 9,000 tons more than in 1956.

Good Facilities Essential

Lord Rusholme stressed that the Commission and British Railways were conscious of the vitally important part which the rail and sea link played in tourism and trade between Northern Ireland and Britain. They were also aware that the services required by the tourist industry and commerce could not be provided without modern, up-to-date and adequate port facilities and connecting rail services. To this end they had put into service during the past two years new vessels, and were continuing to build and to give attention to port facilities.

Dealing with points which had been raised earlier by the newly elected Chairman of the Ulster Tourist Development Association, Mr. S. Stanfield, as to better advertising of Ulster in the British Railways' Regions, and the improvement of rolling stock, he said that no public undertaking could be expected to provide facilities to meet all demands on just a few peak days of the year.

Anglo-Irish Freight Services

Referring to freight services, Lord Rusholme pointed out that the mv. *Container Enterprise* had been put into operation, and in August a second vessel, *Container Venture*, would be launched. The new service could deal with more than the entire quota of freight at present carried, but he believed it would lead to a greater expansion of trade between Northern Ireland and Britain.

Institute of Transport Dublin Congress

The Institute of Transport Congress was held in Dublin on June 3-6. The Chairman of the congress was Commander A. J. O'Brien Twohig, Chairman of the Irish Section of the Institute.

Sir Reginald Wilson, President of the Institute, welcomed members and friends at the Gresham Hotel in the evening of June 3. Next morning the proceedings opened. Members were given a civic welcome by the Lord Mayor of Dublin, Alderman J. Carroll. A discussion was held of the paper by Mr. T. C. Courtney, Chairman of Coras Iompair Eireann, entitled "The changeover to diesel traction on Irish railways"; this paper was summarised in last week's issue. Irish Shell Limited entertained members to luncheon at the Gresham Hotel. Visits included the

Inchicore railway works of C.I.E. and Collinstown airport. The Minister of Industry & Commerce, Mr. Sean Lemass received members and guests in the evening at Iveagh House.

On June 5 the congress discussed the paper "The organisation of transport," by Sir Brian Robertson, Chairman of the B.T.C., who was prevented by pressure of business from coming to Dublin. This paper was the subject of editorial comment last week. Members and guests were entertained to luncheon at the Gresham Hotel by Aer Lingus, British European Airways, the British & Irish Steam Packet Co. Ltd., and British Railways, London Midland Region. The port of Dublin was visited during the afternoon. A reception by the President was held in the evening at the Gresham Hotel. On June 6 members travelled by C.I.E. radio diesel train to Killarney and back. Luncheon and tea in the train were at the invitation of the Irish Dunlop Co. Ltd.

New Marshalling Yard at Margam

Work is well under way on the marshalling yard being built by the Western Region of British Railways near the Steel Company of Wales Limited, Abbey Works, Margam, Glam., adjacent to the South Wales main line between Pyle and Port Talbot. At present the earthwork is about 60 per cent completed.

Since the new running lines and sidings serving the Steel Company of Wales plant were completed in 1949, steel traffic has developed, and the new yard is being built to deal with additional traffic at Port Talbot, Llanelly, and elsewhere in South Wales.

The yard covers an area of 178 acres. The main features are an up and down hump yard with 12 reception sidings with engine release road and engine return road, 48 sorting sidings, with cripple and brake van sidings; 10 storage sidings, and space for a diesel motive power depot.

Certain sidings have been allocated exclusively for the Steel Company of Wales, inward traffics to provide for proper segregation of different types of coal and other traffics for all three works.

Automatic Working

All traffic passing over the hump and through the sorting sidings will be regulated through the control tower, and all working will be automatic including retarders.

Except for insulated joints and point-and-crossing work, rail joints will be thermit-welded throughout.

Diversion of River

The River Kenfig traverses the site, and its water is impounded in the upper reach by a weir which affords a supply of water by pumping for the Steel Company of Wales. Displacement of this weir and provision of a new one on another site is in the design stage, and it will be necessary to bring a temporary weir into use. The requirements of the River Board as to preservation of fish will have to be borne in mind in carrying out this work.

Grasses are being planted to arrest the travel of sand towards the railway from the sandy site of the yard and the adjacent dunes.

The whole of the permanent way, plain line fittings, timbers and other components is being supplied by British Railways. It was necessary to provide a suitable stacking ground for the reception and distribution of this material, some of which is new and some serviceable material recovered from relaying. A preliminary contract, in this connection was entered into in May, and completed in August, 1957.

Civil Engineering Works Involved

The main contract was entered into in June, 1957. It provided for the diversion of the River Kenfig, earthworks, including the formation of the large borrow pit, fencing and footpaths, permanent way, a new underline bridge at Water Street at the Paddington end, a flyover bridge at the outlet of the sorting sidings, small bridges associated with the river diversion, a road bridge and culvert under the hump, cattle pens, drainage, and so on. Contractor's operations to date have been confined mainly to the moving of sand in large quantities.

The main contractors for signalling, retarders, and automatic control equipment are Metropolitan-Vickers G.R.S. Limited. The main contractors for civil engineering work are Sir Robert McAlpine & Sons (South Wales) Ltd. (earthwork, permanent way, bridgeworks, drainage and fencing), and John Morgan (Builders) Limited (control tower).

I.R.S.E. Summer Convention in Denmark

Visits to signalling installations and assembly and manufacturing plants

The annual summer convention of the Institution of Railway Signal Engineers was held in Copenhagen on May 15-20. The party, numbering about 150 members and ladies, left London on May 14 under the leadership of the President, Mr. J. F. H. Tyler, supported by the Senior Vice-President, Mr. D. G. Shipp; Messrs. A. W. Woodbridge, J. C. Kubale and J. H. Fraser, Past Presidents several Members of Council; Mr. G. J. Dickin, Hon. General Secretary; Mr. V. H. Smith, Hon. Secretary General Purposes Committee, responsible for the arrangements, and Mr. B. Reynolds, Hon. Treasurer to the convention.

Inspection of C.T.C. Installation

On May 16 a whole day tour was made to the island of Fyn, in the course of which members were afforded an opportunity of inspecting the C.T.C. installation between Odense and Nyborg, the control panel for which is at the former place; the working was fully explained by engineering assistants. This work forms the first part of a scheme which ultimately will extend right through to Fredericia. The party was entertained to lunch by the Management of the Danish State Railways; the chair was taken by Mr. P. E. N. Skov, General Manager, accompanied by Mr. W. Wessel Hansen, Signal Engineer, and other officers.

Mr. Skov expressed the pleasure his Management felt at being able to receive the Institution on its first visit to Denmark, where he hoped they would find much to interest them in conditions somewhat different from those in the United Kingdom.

Mr. Tyler expressed the gratitude of all present for the hospitality extended to them and the facilities for inspecting the C.T.C. equipment, also other signal apparatus in due course. They admired the progress being made in Denmark in these matters.

The Institution informal dinner was held on the evening of May 17 at the Hotel Mercur in Copenhagen. Mr. Tyler presided; among the guests were Mr. Skov, Mr. Hansen, Mr. Jensen, of Dansk Signal Industri A.S., and Mr. H. Insulander, of L. M. Ericsson Signalaktiebolaget, of Sweden.

Mr. Tyler, after proposing the toast of the Danish sovereigns and people, spoke of the great pleasure it afforded him to lead such a visit, which enabled members to appreciate and learn from what was being accomplished on the Danish State Railways.

Mr. Skov, replying, wished success to the Institution in its work for the signalling profession and the advancement of signal engineering knowledge.

Mr. D. G. Shipp, Senior Vice-President, moved a cordial vote of thanks to the General Purposes Committee and Mr. V. H. Smith, its Hon. Secretary, and to Mr. B. Reynolds, who had acted as Hon. Treasurer to the convention, for the efficient manner in which it had been organised from the Institution's side.

Signal Equipment Works

On May 19 members inspected the assembly shops of the Danish State Railways at Valby, where the components of relay interlocking equipment of all kinds are dealt with and complete sets of apparatus put together, and also the factory at Dansk Signal Industri A.S., where the manufacture and testing of signalling apparatus was seen and operation of certain items of equipment demonstrated.

In the evening the party was entertained to dinner by Dansk Signal Industri A.S. and L. M. Ericsson Signalaktiebolaget. Mr. Jensen and Mr. Insulander welcomed the visitors. Mr. Tyler expressed the Institution's thanks for the facilities and hospitality so generously accorded, and stressed the great kindness received that evening.

The party left Copenhagen on May 20 and reached London the following afternoon.

SPECIALLOID TO MANUFACTURE POWDER COUPLINGS.—Specialloid Limited, which company has acquired the major share capital of Powder Couplings Limited, is to manufacture powder couplings; the design will differ substantially from that of couplings manufactured by Stone-Wallwork Limited. Ball and roller bearings will be used instead of bronze bushings and mechanical seals will replace the felt type. One type of coupling can be used for both pulley and in-line drives and provision has been made for securing the driving component by bolts to the main hub. Further details can be obtained on application. After July 1, all communications relating to the manufacture, sale or servicing of powder couplings, should be addressed to Powder Couplings Limited, 20, Black Bull Street, Leeds 10.

Staff and Labour Matters

London Busmen's Wage Claim

After further negotiations between London Transport Executive and the Transport & General Workers' Union on June 5, no progress was made towards ending the strike of the London busmen. The talks broke down after the gap between the parties had narrowed slightly. The London Transport Executive repeated its offer of a general review of the pay of workers excluded from the Industrial Court Award to Central bus crews and said that any increase which may be agreed as a result of the review should be paid on and from July 2. Previously, the review had been offered without commitment as to date. The Executive also renewed its proposal of an increase of 8s. 6d. to Central bus crews with effect from the date of resumption of work and negotiations for an increase to Green Line Coach Drivers to be paid from the same date.

Mr. Cousins of the Transport & General Workers' Union pressed that the 8s. 6d. rise for the Central London busmen should be back-dated to March 12, the date suggested in the Industrial Court Award. For the Outer London men he insisted that there should be a firm promise of an increase and that it should be back-dated, once the amount had been agreed, to the date of resumption of work.

The situation was considered by a delegate conference of London bus workers on June 6, when it was decided to reject the latest terms offered by the London Transport Executive and to continue the strike. The motion that the strike should be extended to other members of the Transport & General Workers' Union, such as petrol distribution and power station workers, was rejected by a narrow margin on the advice of Mr. Cousins.

Meanwhile, because of criticism of the decision of the General Council of the T.U.C. to give advice against extending the London bus strike, the General Secretary of the T.U.C. issued the following statement explaining the position, on June 8:—

"Whatever may be the pros and cons of the General Council's decision on Wednesday last in connexion with the London bus dispute, this is not the time when the General Council would, from choice, desire to enter into full public controversy.

"It is necessary, however, that trade unionists should know that when the General Council took its decision last week there were no dissenting voices among those not directly involved in the dispute itself.

"I think it should also be known that the Transport & General Workers' Union were not asking for—and indeed would have resented—any interference by the General Council in the conduct of negotiations as distinct from any efforts that might be made to get negotiations resumed. This is not a complaint, it is a statement of fact.

"The General Council was asked to declare what it and affiliated unions should do and the discussions centred mainly on the extension of the stoppage both on a restricted and on a total front.

"Furthermore the discussion did not take five hours because of any acrimony but because of the detail of the review and the readiness of members to express their opinions in full knowledge of the position and with a knowledge of their responsibilities to the movement as a whole. They spoke also, of course, in the light of the knowledge of their own members, their organisations, and the industries with which they are concerned.

"Mr. Cousins heard the views of members at first hand and, even if he was disappointed, it was typical of his courage that, according to reports, he opposed a majority recommendation of the London busmen's negotiating committee that the strike should be extended."

Despite appeals by the N.U.R., some tube branches of the N.U.R. decided to stage unofficial action every Monday in sympathy with London busmen, and on Monday, June 9, there was evidence that there had been some response in that there was a stoppage of work by some staff at certain centres.

In a speech on June 9, the Minister of Labour outlined the bus strike situation as he saw it and made the following points:—

(1) Nobody contested the right, in law, to disregard the decision of the Industrial Court, though this was the first time that a major strike had been called after a decision from the highest arbitral body in industrial relations.

(2) The letter asking for the pay dispute to be referred to the Industrial Court made no reservation on acceptance of its ruling. The terms of reference, agreed by both sides, began with the words "to determine a difference."

(3) Had there been any reservation, the Minister did not think it would have been proper to ask Sir John Forster, president of the Industrial Court, to accept such a conditional reference.

(4) Sir John Forster was in the position of a judge, not of counsel offering an opinion. "The Industrial Court is quite different from the Railway Staff National Tribunal which issues recommendations, not decisions and there is no comparison between it and the National Health Whitley Council, whose recommendations are subject to the Minister's approval."

(5) The validity of the Industrial Court Award did not disappear because of the strike. "It may not have settled the dispute but it remains an independent judgment of what would have been a fair and reasonable settlement."

On June 11, at his own request, Mr. Cousins met the Minister of Labour. Sir Wilfred Neden, Chief Industrial Commissioner, was present at the subsequent meeting, which lasted 45 minutes. Afterwards, Mr. Cousins met his negotiating committee.

Railway Shopmen's Wages

The application for an increase in the wages of railway shopmen was again considered by the Railway Shopmen's National Council at a meeting on June 10.

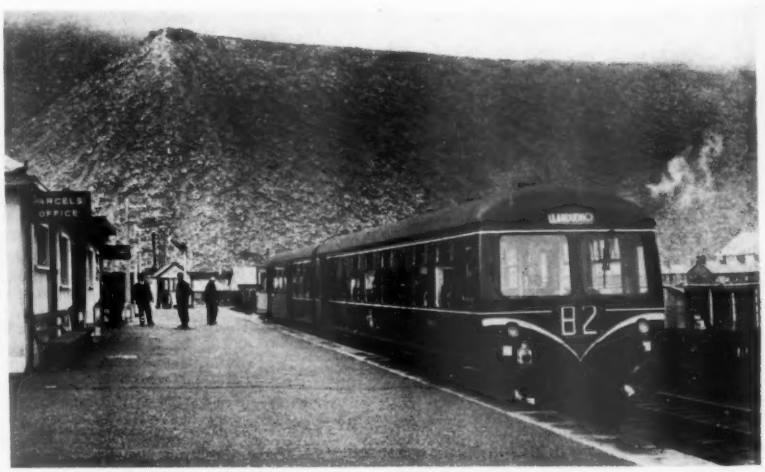
At this meeting the Employees' Side of the Council renewed its claim, which was declined by the British Transport Commission in February last, for improved rates of pay for railway workshop staff.

The Employer's Side of the Council undertook to reply to the submissions of the trade unions at a further meeting of the Council on June 26.

Pullman Car Staff

The Pullman Car Company has agreed with the N.U.R. to increase the rates of pay of its staff by 3 per cent as from June 30.

Diesel Working in North Wales



Diesel train at Blaenau Ffestiniog, London Midland Region. The re-opening to this point of the Festiniog Railway is expected to cause an increase in excursion traffic, through booked over the two railways

Contracts and Tenders

Multiple-unit diesel railcars for British Railways

The British Transport Commission has placed orders for 217 diesel multiple-unit train vehicles, each of 57-ft. in length, comprising 56 three-car and 27 two-car sets, and one powered car, for use in the Eastern, North Eastern, and Scottish Regions of British Railways, as follows:—

Metropolitan-Cammell Carriage & Wagon Co. Ltd., Birmingham: 44 three-car sets each comprising one motor brake open second class, and one motor open composite, both fitted with two B.U.T. engines of 150 h.p., and one trailer open composite, 20 sets for use in the North Eastern Region, and 26 sets in the Scottish Region; 10 three-car sets, each comprising one motor brake open second class and one motor open composite, both fitted with two Rolls-Royce engines of 180 h.p., and one trailer open second class buffet car, for use in the North Eastern Region.

Cravens Limited, Sheffield: 24 two-car sets, each comprising one motor brake open second class, fitted with two B.U.T. engines of 150 h.p., and one driving trailer open composite, two sets for use in the Eastern Region, and 22 in the Scottish Region; one motor brake open second class vehicle fitted with two B.U.T. engines of 150 h.p., for the North Eastern Region.

The Yorkshire Engine Co. Ltd., Sheffield, a branch of the United Steel Cos. Ltd., has received an order to the value of £350,000 for the supply of 16 diesel-electric shunting locomotives to the Port of London Authority. The first of the new locomotives is due for delivery in April next. Some of the locomotives will be twin-engined 400-h.p. units and the remainder will be powered by single 300-h.p. engines. All the engines are of Rolls Royce manufacture and the electrical equipment will be supplied by British Thomson-Houston Co. Ltd. The locomotives will be engaged on heavy shunting duties at the P.L.A. Royal and Tilbury docks.

W. H. Dorman & Co. Ltd. has received a contract for the supply of 28 "L" type four-cylinder Dorman diesel engines to drive standby generators which will form part of a N.A.T.O. pipeline installation in Belgium.

British Railways, Southern Region, has placed a contract with Pritchett & Gold & E.P.S. Co. Ltd., for storage battery equipment for the Kent Coast electrification scheme as follows:—

31 110-V. batteries for switch operation in substations

65 50-V. batteries for supervisor control, 31 to be installed in the substations and 34 in track-paralleling huts.

2 50-V. high-capacity batteries for the supervisory control room at Canterbury.

All of the batteries will be complete with suitable selenium rectifier charging and associated distribution equipment.

British Railways, Eastern Region, has placed the following contracts:—

Arundel Painting Contractors & Company, Louth, Lincs: cleaning and painting of station buildings, goods yards, sheds, offices, signalboxes, signals, and point rodding at Barnby Dun, Stainforth and Hatfield, Thorne South, Medge Hall, Crowle Central and Althorpe Stations

W. & C. French Limited, Buckhurst Hill, Essex: reconstruction and widening of superstructures of overbridges Nos. 1480, 1482 and 1483 at Bishop's Stortford

Metropolitan-Vickers-GRS Limited, London, W.C.2: suply and installation of retarder brake control equipment at Ripple Lane New Marshalling Yard.

British Railways, North Eastern Region, has placed the following contracts:—

Hadden & Hillman Limited, Newcastle: conversion of canteen to messroom and washing facilities, Heaton Motive Power Depot

Brightside Heating & Engineering Co. Ltd., Newcastle: heating, hot and cold water, and gas services, Heaton Motive Power Depot

Bellis & Morcom Limited, Birmingham: air compressor set and equipment, Darlington North Road Locomotive Works.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Thailand:

10 diesel railcars, metre gauge.

The issuing authority and address to which bids should be sent is the Stores Superintendent, State Railway of Thailand (Railways Organisation), Yod-Se, Bangkok. The tender No. is Sor. 2/12129. The closing date is August 8, 1958. A deposit of Bht. 100,000 is required. The Board of Trade reference is ESB/14345/58.

From South Africa:

29,500 tons of 2,000-lb. S.A.R. 61-lb. flat bottom steel rails, as shown on drawing E.192/6, in high carbon steel, medium manganese steel, or Thomas steel

6,000 tons of 2,000-lb. S.A.R. 81-lb. flat bottom steel rails as shown on drawing E.346/8, in high carbon steel, medium manganese steel, or Thomas Steel

10,000 tons of 2,000-lb. S.A.R. 96-lb. flat bottom steel rails as shown on drawing E.358/7, in high carbon steel, medium manganese steel, or Thomas Steel

1,000 tons of 2,000-lb S.A.R. 96-lb. higher manganese flat bottom steel rails 1.7 to 2 per cent manganese as shown on drawing E.358/7.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, enclosed "Tender No. A7304: Rails" should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is June 20, 1958. Local representation is essential. The Board of Trade reference is ESB/14192/58.

From India:

18,900 spring steel rail anchors, fair V type, to 75 R to C.S.O. drg. No. E.D.O. 277

3,000 spring steel rail anchors, fair V type, to 50 lb. R. to C.S.O. drg. No. E.D.O. 279

7,000 spring steel rail anchors, fair V type, to 115 lb. FF.BS. rails

80,000 spring steel rail anchors, fair V type, stepped 90 lb.

55,000 spring steel rail anchors, fair V type, two stepped 50 R-50 BS

68,550 spring steel rail anchors, fair V type, stepped to 60 R-60 BS

70,000 spring steel rail anchors, fair V type, two stepped 50 R-50 NS

15,000 spring steel rail anchors, fair V type, two stepped 50 R-41¼

10,000 spring steel rail anchors, fair V type, to 50R-40 lb. B.N. rails section with stepping for 3½ in. and 3$\frac{15}{16}$ in. flange width

10,000 spring steel rail anchors, fair V type, to suit 50R and 41 lb. B.N. rails section with stepping for 3½ in. and 3$\frac{15}{16}$ in. flange width.

The issuing authority is the Director-General of Supplies & Disposals. The tender No. is WPI/RC.III/II/RA. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is June 25, 1958. Local representation is essential. The Board of Trade reference is ESB/14371/58.

From Korea:

11,500 sleepers, 8 ft. by 8 in. by 6 in., preservative treated

3 sets of sleepers, 9 in. by 7 in., for No. 10 turnout, preservative treated, 58 sleepers each set in lengths varying from 8 ft. 6 in. to 15 ft. 6 in.

The issuing authority and address to which bids should be sent is the Office of Supply, Government of the Republic of Korea, Seou, Korea. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The tender No. is 89-52-251-6-70365. The closing date is June 20, 1958. The Board of Trade reference is ESB/14393/58/I.C.A.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for tenders from Costa Rica for two diesel-hydraulic locomotives recorded on page 581 of our May 16, issue, has been postponed to June 17, 1958.

EXCURSIONS TO ROYAL HIGHLAND SHOW AT AYR.—Many excursions have been arranged by the Scottish Region of British Railways for the Royal Highland & Agricultural Society Show at Ayr from June 17 to 20. The Scottish Region TV train has been chartered by a cattle feed firm for a staff outing starting from Aberdeen at 6.5 a.m. and leaving Ayr at 6.5 p.m. on the return journey. On this occasion it has been named the "6.5 Special." Entertainment will be provided from the specially equipped studio on the train and screened on television sets throughout the train, which includes a buffet car. At the showground, British Railways staff will be in attendance at a mobile ticket and enquiry office.

Notes and News

Motorcar Manufacture at Former G.N.R.(I.) Works.—The first section of the Heinkel motorcar manufacturing plant is reported to have been offloaded in the port of Dublin, en route to Dundalk, where it will replace the workshops of the Great Northern Railway.

Salvador Railway Co. Ltd. Results.—The consolidated operating profit of the Salvador Railway Co. Ltd. for the year ended June 30, 1957, was £13,539 compared with £13,657 in the previous year. Exchange differences added a further £10,205 (same). The net profit after tax was £19,401 (£20,511).

Ransomes & Rapier Dividend.—The annual meeting of Ransomes & Rapier Limited, it is reported, will most probably be held in September and not on June 27 as previously announced. A recommendation will be made for payment of a final dividend of 5 per cent, free of tax, payable in September, making 7 per cent for the year 1957. This is the same as for the previous year. Last month the company stated that in view of the merger with Newton Chambers & Co. Ltd. having been declared unconditional no final dividend would be paid for the year 1957.

Single Representative Body of Engineers Proposed.—The case for a single representative body of engineers in Britain was pleaded last week by Sir Arthur Whitaker, President of the Institution of Civil Engineers, at the annual dinner of the institution in London. He had reported in some detail on his recent tour of three of the Dominions, and other countries of the British Commonwealth, and he added that one of the things for which he rather envied the engineers of those countries was that they had only one institution to look after their affairs. The three major bodies of engineers in this country, he added, certainly worked well together, but he hoped that they were going to try seriously to see how much nearer they could get to one another.

Thomas Firth & John Brown Limited.—The interim ordinary dividend of Thomas Firth & John Brown Limited has been maintained at 4 per cent on the capital increased to £7,700,000 by a two-for-five rights issue.

Glasgow Suburban Electrification.—The laying of foundations for the overhead wiring system for the Glasgow suburban electrification scheme were continued last week, when work was carried out between Old Kilpatrick and Dumbarton.

Express Working in the London Midland Region.—In the caption to the illustration of the down "Caledonian" published on page 628 of our May 30 issue, the name of the locomotive was incorrectly stated to be *City of Sheffield*. The correct name of the locomotive, No. 46239, is *City of Chester*.

All-In Tours to Ireland.—Some 600 passengers have already booked for the All-in tours to Ireland which have been introduced by British Railways, the Creative Tourist Agents Conference, and Coras Iompair Eireann. These tours, which start each Tuesday from Euston, Birmingham, Manchester, and other provincial towns, cover six different holiday centres in Ireland. All-in charges, ranging from £20 for the week cover train and sea journey, meals en route, hotel, sightseeing trips, and gratuities.

British Railways Golf Championships.—At Gleneagles on June 4 the Southern Region won the team championship shield in the British Railways Staff Association annual inter-Regional golf championships. The Southern and Scottish Region teams had tied with a score of 607 for rounds over the King's and Queen's courses and the result was decided on the last round scores of 301 for the Southern Region and 302 for the Scottish Region. The cup for the individual title was won by Mr. Douglas Sewell (Woking, Southern Region) with a total of 137; Mr. J. T. Brown (Nairn, Scottish Region) was second with 149. Mr. James Ness, General Manager, Scottish Region, congratulated the winners; the team championship shield and the cup for the individual title were presented by Mrs. Ness.

Death in Burning Railway Embankment.—A schoolboy was burned to death last week at Bargeddie, Lanarkshire, when a smouldering embankment gave way under him. With two other boys he was kicking a ball when it landed on a disused railway embankment, which has been smouldering for years. When he climbed on to the embankment to recover the ball part of it caved in underneath him and he fell into a hole.

Vent-Axia Limited Increased Dividend.—An increased dividend and profits are announced by Vent-Axia Limited for the financial year ended March 31. The dividend is being effectively increased by 1¼ per cent to 35 per cent on the capital increased by a 2-for-1 issue of fully-paid shares (from the equivalent on the present capital of 33⅓ per cent paid for 1956-57) with a final payment of 25 per cent. Group profits rose by nearly £45,000 to £290,235 before tax of £158,902 (£132,902). The general reserve is allocated £79,800 (£72,000).

Gatwick Airport Opened.—The Queen opened the new airport at Gatwick, Surrey, on June 9. This is believed to be the first airport in the world to combine air, road, and rail facilities. At the opening ceremony, the Queen said that the combination of a good road and rail link, with modern buildings and facilities, would help to make a favourable impression on visitors to this country. The new Gatwick Airport Station, British Railways, Southern Region, which came into use on June 8, was described in our issue of April 18.

British Railways Fire-Fighting Competition.—Railway fire-fighting teams from all Regions of British Railways competed in the finals of the eighth Inter-Regional Fire-Fighting Competition at Marylebone Station on June 3. The two-man extinguisher drill was won by the B.T.C. Police, Leicester, London Midland Region; the three-man hydrant drill by Barrow Hill Motive Power Depot, Eastern Region; and the five-man trailer pump drill by Kings Cross Road Motor Engineers, Eastern Region. A team formed from Barrow Hill Motive Power Depot, and Kings Cross Road Motor Engineers, will represent British Railways at the first of a new international fire-fighting competition between European and Scandinavian railways in Holland later this year.

D. Napier & Son Ltd. 150th Anniversary Exhibition.—An exhibition to mark the 150th anniversary of the formation of D. Napier & Son Ltd. has been arranged at the Tea Centre, Lower Regent Street, London, W.1. The exhibition, which was opened on June 3 and closes tomorrow (Saturday), presents a visual history of the growth of the company since 1808. Besides the early machines built for the printing and minting fields and the development of the Napier motorcar and

Western Region Publicity

Two new season's posters produced by the Public Relations & Publicity Department, Western Region, British Railways, for display during 1958-59

aero-engine, the exhibition also deals with the "Deltic" two-stroke horizontally-opposed diesel engine and Napier turbo-blowers for pressure-charging diesel engines. A sectioned model of the prototype English Electric "Deltic" Co-Co locomotive illustrates the application of this engine to railway motive power; a model of the English Electric-Vulcan 1,000-h.p. Type "1" Bo-Bo locomotive for British Railways is shown on the part of the exhibition which deals with turbo-blowers. These latter products are also being fitted to diesel locomotive engines of makes other than the English Electric Co. Ltd. with which D. Napier & Son, Ltd. is associated.

German-built Bogies for C.N.R. Passenger Stock.—Reference was made on page 505 of our May 2 issue of tests of passenger coach underframes built by Westwaggon for the Canadian National Railways. We are informed by Westwaggon that the equipment under test is MD type bogies, and that no underframes have been supplied to the C.N.R.

Glazebury Station to Close.—British Railways, London Midland Region, announces that Glazebury Station, between Kenyon Junction and Patricroft, is to be closed from Monday July 7. Passengers should book to Leigh or Kenyon Junction, according to direction of travel, and thence by buses of Lancashire United Transport Co., Ltd., or Leigh Corporation Transport. Parcels and passenger train merchandise will be dealt with at Leigh, as will merchandise, minerals and livestock traffic.

Antofagasta (Chili) & Bolivia Railway Co. Ltd.—The directors of the Antofagasta (Chili) & Bolivia Railway Co. Ltd. have decided to defer payment of any dividend on the 5 per cent cumulative preference stock, usually paid in July, in view of the deterioration of the financial position. The results for the year ended December 31, 1957, are not yet available, but after paying debenture interest there will be an operating loss. For 1956, a dividend of 4 per cent was paid on the consolidated ordinary stock.

Railway Exhibition at Carlisle Station.—Sir John Kennedy, Member of the London Midland Area Board of the British Transport Commission, opened a railway exhibition organised at Carlisle Station, London Midland Region, in conjunction with the city's Octocentenary Celebrations, on June 6. Accompanying were Lord Rusholme, Member of the B.T.C. and Chairman of the London Midland Area Board, Mr. David Blee, General Manager, and Mr. J. Howarth, Member of the Area Board, Mr. J. Taylor Thompson, Chief Civil Engineer of the London Midland Region, and Captain J. D. Reed, Manager, Irish Shipping Services. The exhibition, which features historic locomotives and carriages and also models and other displays of modern railway equipment, is on platform 6 and is open to the public until June 18.

Fuel Flow Test House.—A fuel flow test house, claimed to be the most extensive of its kind in Europe, was opened on June 6 by the Minister of Supply, Mr. Aubrey Jones. It has been set up by Firth Cleveland Instruments Limited, the recently formed subsidiary of Simmonds Aerocessories Limited, at Treforest, Cardiff. It will provide facilities for calibrating and production-testing flowmeters, water separators, valves, and other fluid-handling equipment, and includes apparatus for future development requirements. Complete facilities for testing to Government and other specifications are available to manufacturers in the United Kingdom and Western Europe. The parent company previously specialised in fuel equipment for the aircraft industry; the new company will expand the interest to other industries requiring accurate measurement of liquids.

John Summers & Sons Ltd. Interim Dividend.—The directors of John Summers & Sons Ltd. have declared an interim ordinary dividend of 6 per cent in respect of the year ending about September 29, and payable on July 15. Trading results for the first seven months of the current year compare favourably with those for the same period of last year, it is reported, and it is hoped to maintain the total dividend at the rate paid last year (14 per cent).

Kitchen & Wade Second Interim Dividend.—The directors of Kitchen & Wade Limited have declared a second interim dividend of 8¼ per cent, and a bonus of 4⅛ per cent, payable July 9, in respect of the year ended March 31. This makes an unchanged total for the year of 20⅝ per cent. Consent of the Capital Issues Committee has been obtained to an issue of fully-paid shares on a one-for-two basis. Net profits were £100,724 (£113,248) after tax of £113,496 (£119,707).

Birfield Industries Limited Trading Results.—The sales of Birfield Industries Limited for the six months ended January 31 were £10,067,000, compared with £7,761,000 for the five months and 20 days ended January 31, 1957. Approximate net trading profits were £790,000 (£501,000) and were arrived at after deduction of all trading outgoings including depreciation, but before providing for tax and reserve for increased replacement cost of fixed assets.

Portsmouth (Yorkshire) Station to Close.—Portsmouth Station, between Burnley and Todmorden, London Midland Region, is to be closed for passenger traffic from July 7. Passengers should book to Todmorden and Burnley Manchester Road, according to direction of travel, and thence by buses of Todmorden Corporation & British Railways Joint Committee. Parcels and passenger train merchandise will be dealt with at Todmorden, and present arrangements for freight train traffic will continue.

Possibility of Redundancy Among Country Busmen.—At the annual general meeting of the B.E.T. Omnibus Services Limited, held on June 9, the Chairman, Mr. J. S. Wills, spoke of the danger of redundancy if further wage claims were demanded and secured by employees in the bus industry. "So important is the question of wages," he stated, "that the future of the industry now very largely lies in the hands of the men and women who work in it." Wages, he pointed out, amounted to nearly 70 per cent of the total costs of the company. He also expressed his opinion that there was no reasonable alternative to arbitration as a means of settling wage disputes: "Until something better is evolved, we ought to stand by it."

A.T.C. on N.E. Region Main Line.—Automatic train control is to be installed on the East Coast Main Line of the North Eastern Region between Shaftholme Junction, north of Doncaster, and Berwick. Work already has started on fitting locomotives; and during the next five years 1,168 steam, and two electric locomotives, and 578 diesel multiple-unit and 129 electric multiple-unit cabs are to be equipped; a further 590 steam locomotives will be fitted later on. Installation of the ground apparatus will begin shortly and the first section to be equipped will be between Shaftholme Junction and Selby; work will proceed northwards and it is hoped to reach Newcastle by the end of 1959.

Diesel Railcars between Musselburgh and Waverley, Scottish Region.—Diesel railcars were introduced on Monday on the Musselburgh/Waverley/Inner Circle suburban route of Scottish Region. Provost James Lannan, with members of Musselburgh Town Council, inspected one of the diesel trains. They were welcomed at Musselburgh station by Sir Hugh Rose, Mr. F. Donachy, Members of the Scottish Area Board; and Mr. James Ness, General Manager, Scottish Region. Besides the Musselburgh service, diesel railcars were also introduced into regular suburban service on the Waverley/Rosewell and Hawthornden route.

Parcels Train Derailed.—The steam locomotive and the first three coaches of the 6.30 a.m. Euston-Carlisle parcels train were derailed near Tamworth Station, London Midland Region, on June 8. The locomotive fell on its side and the driver was trapped up to his waist in coal shaken from the tender. He was brought out with a slight cut on his hand. The fireman and guard escaped with shock. Trains from Euston to the north were diverted via Stechford and Bescot. The line was cleared early on June 9.

J. Stone & Co. (Holdings) Ltd. Increased Dividend.—For the financial year ended 1957, the ordinary and "A" ordinary dividend of J. Stone & Co. (Holdings) Ltd. is being raised to 18 per cent with a final payment of 14 per cent. The total dividend for 1956 was 16 per cent but in addition a special distribution of 2 per cent was paid out of realised capital profits. Group profits rose by nearly £370,000 to £1,438,313 and after charging tax of £811,913 (£508,651) net profit was £626,400 (£563,434), in which was added profits on sales of trade investments of £243,707.

Withdrawal of Manchester to Guide Bridge via Fallowfield Passenger Service.—British Railways, London Midland Region, announces that the passenger train service between Manchester Central and Guide Bridge via Fallowfield will be permanently withdrawn from July 7. The following stations will be closed for passenger traffic: Wilbraham Road, Fallowfield, Levenshulme South, and Hyde Road. Bus services operate in the area. Parcels and passenger train merchandise for Wilbraham Road, Fallowfield, and Hyde Road will be dealt with at Manchester London Road, and that for Levenshulme South at Stockport Edgeley. The stations remain open for freight traffic.

Forestal Land, Timber & Railways Co. Ltd.—Sir Gerard d'Erlanger, Chairman, Forestal Land, Timber & Railways Co. Ltd., has stated that because of the running down of stocks last year, there was a considerable improvement of the group's liquid position, and at December 31, 1957, cash balances and deposits other than in Argentina were £534,161 higher than a year earlier, while stocks and accounts receivable were correspondingly reduced. Group

profits, before tax, were £59,187 higher at £1,074,551. Net current assets of the Argentine group fell by pesos 23,100,000 and because of the effect of adverse trading conditions it was necessary to arrange for bank loans to finance capital expenditure.

Hale & Hale (Tipton) Limited Interim Dividend.—The Directors of Hale & Hale (Tipton) Limited have declared an interim ordinary dividend of 5 per cent for the current year. They have stated that the company, like many others, has felt the effect of the disturbances in the field of industry and while they do not wish to strike a pessimistic note, it has been decided, as a precautionary measure, to pay an interim ordinary dividend of 5 per cent instead of the usual 7½ per cent.

Simplex 30-h.p. Narrow-Gauge Diesel Locomotive.—Motor Rail Limited of Bedford has announced an addition to its range of Simplex narrow-gauge diesel locomotives. Built in 2½-, 3½- and 4½-ton weights, this 30-h.p. model supersedes the Simplex 28-h.p. series, having greater power and a higher speed range. The engine employed is a Dorman 2 LB; engine speeds are governed from 380 r.p.m. to 1,800 r.p.m., at which speed it develops 35 b.h.p. It is available for gauges of 1 ft. 6 in.—2 ft. 6 in. and 2 ft. 11 in.—3 ft. 3⅜ in (1 m.); with a wheelbase of 3 ft. 4½ in., the locomotive will negotiate curves, of 30-18 ft. rad. In low gear, the 2½-ton locomotive has a tractive effort of 1,250 lb., the efforts of the 3½- and 4½-ton models being 1,750 and 2,250 lb. respectively.

Further Stations to Close in London Midland Region.—Rimington Station, between Chatburn and Hellefield, in the London Midland Region, is to be closed from July 7. Passengers should book to Gisburn or Chatburn, according to direction of travel, and thence by bus. Parcels and passenger train merchandise will be dealt with at Clitheroe and alternative arrangements will be made for freight train traffic. Radcliffe Bridge Station between Salford and Bury, also in the L.M. Region, is to be closed from the same date. Bus services operate in the area. Parcels and passenger train merchandise will be dealt with at Radcliffe Central. From the same date also Welton Station, between Blisworth and Rugby, is to be closed for passenger traffic. Passengers should book to Long Buckby or Rugby Midland, according to direction of travel, and thence by bus. Parcels and passenger train merchandise will be dealt with at Northampton, and present arrangements for goods traffic will continue.

U.S.A. Main-Line Passenger Service Abandoned.—The traffic commissions of the States of New Jersey, Delaware, Pennsylvania and Maryland all having given their consent, the passenger service which the Baltimore & Ohio Railroad has maintained into and out of Jersey City has been withdrawn. The B. & O. has always suffered from the fact that communication between Jersey City and New York had to be made under or over New York Harbour by motorbus or ferry, whereas the competing Pennsylvania Railroad runs its trains under the river into the heart of the city. Also the B. & O. had to use Central or New Jersey tracks between Philadelphia and Jersey City to obtain its access to the latter. Philadelphia also has lost the passenger service of the B. & O., the eastern terminus of which now is Baltimore. Trains which now start from or terminate at Baltimore are the "Capitol Limited" and "Shenandoah" to and from Chicago and the "National Limited" and "Diplomat" to and from St. Louis; the "Royal Blue," hitherto operating between New York and Washington, has been withdrawn.

Forthcoming Meetings

June 14 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section. Visit to Hull Docks.

June 14 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Ipswich. Film "Teeth of steel," introduced by Mr. A. Stokes.

July 17 (*Thu.*).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "L.N.E. cavalvade," by Mr. R. A. H. Weight.

Railway Stock Market

Buyers were rather more in evidence in stock markets, and with very little selling devloping, share prices, where changed, have moved in favour of holders. The London bus strike and the wage claims made in other industries continued to have a restraining influence; but for these factors, strong and active stock markets might be in evidence. The further rise in gold and dollar reserves, the underlying strength of the £, and the possibility of a reduction in the bank rate to 5 per cent in the near future are all hopeful market talking points. It appears, moreover, that the trade recession in the U.S.A. has been checked. On the other hand almost all annual statements by company chairmen contain warnings that, because of increased competition both at home and abroad, profit margins are narrowing. In the circumstances higher dividends for the current year could very well prove an exception, though the prevailing belief is that there are good prospects of most dividends being maintained; and on this basis, many shares offer quite attractive yields.

There was little business passing in foreign rails; but where changed, they tended to reflect the rather better trend in markets. Antofagasta ordinary stock, for example, was 13½, a gain of a point compared with a week ago, while the preference stock showed a similar improvement at 28½.

Canadian Pacifics have rallied from $48¾ to $49¾, and although the preference stock eased to 54, the 4 per cent debentures moved fractionally higher at 65⅛. White Pass strengthened from $13¼ to $14¼, but Peru Transport shares eased to $⁹⁄₁₆. Mexican Central "A" bearer debentures remained at 65.

San Paulo Railway 3s. units kept around 2s. 1¼d. and Brazil Railway bonds eased to 5; but Chilean Northern debentures were again 38 and Costa Rica ordinary stock 17, but the first debentures of the latter company moved up from 72⅞ to 74½. United of Havana second income stock kept at 6½. International of Central America shares and preferred stock were $20½ and $123 respectively. Nyasaland Railway shares at 11s. 3d. and the 3½ per cent debentures at 58½ were also the same as a week ago.

Associated Electrical shares have been maintained at 48s. on expectations of oversubscription of the £25,000,000 issue of 6 per cent debentures. The issue price is 98½, and redemption dates 1978-83. The yield of almost 6¼ per cent is attractive for a first class security of this kind, and there is confident talk in the City of a premium in initial dealings. The big issue will of course take a good deal of investment money which could otherwise have gone into existing securities quoted on the Stock Exchange. There are, moreover, expectations of other important new issues before long.

English Electric shares at 51s. 6d. were almost the same as a week ago, and General Electric strengthened from 30s. 3d. to 31s. while Crompton Parkinson 5s. shares have risen afresh from 9s. 6d. to 10s. 6d. xd. on further consideration of the interim dividend.

G. D. Peters remained firmiy held and quoted at 23s. 1½d., while Charles Roberts 5s. shares, after easing, rallied to 7s. 6d.

Beyer Peacock 5s. shares have come back from 8s. 4½d. to 7s. 10½d. Gloucester Wagon 10s. shares held their rise to 15s., Wagon Repairs 5s. shares were again around 11s. 3d. and North British Locomotive, after receding, rallied to 11s. 6d. Birmingham Wagon were again 16s. 6d. Shares of J. Stone (Holdings), advanced from 43s. 9d. to 47s. in response to the good profits and raising of the dividend from 16 per cent to 18 per cent.

Dowty Equipment 10s. shares came back to 30s. and Pressed Steel 5s. shares eased further from 14s. 10½d. to 14s. 7½d. while British Oxygen kept at 34s. 6d., but British Aluminium rose afresh from 41s. 3d. to 43s. Westinghouse Brake moved up further to 39s. 3d. B.I. Cables rose from 43s. to 45s. on further consideration of the chairman's annual statement. F. Perkins remained at 10s. 1½d. and Mather & Platt have advanced further from 56s. 9d. to 58s. 3d. while there was another strong advance from 65s. 6d. to 67s. 6d. in Birmid Industries, British Timken were 47s. 9d.